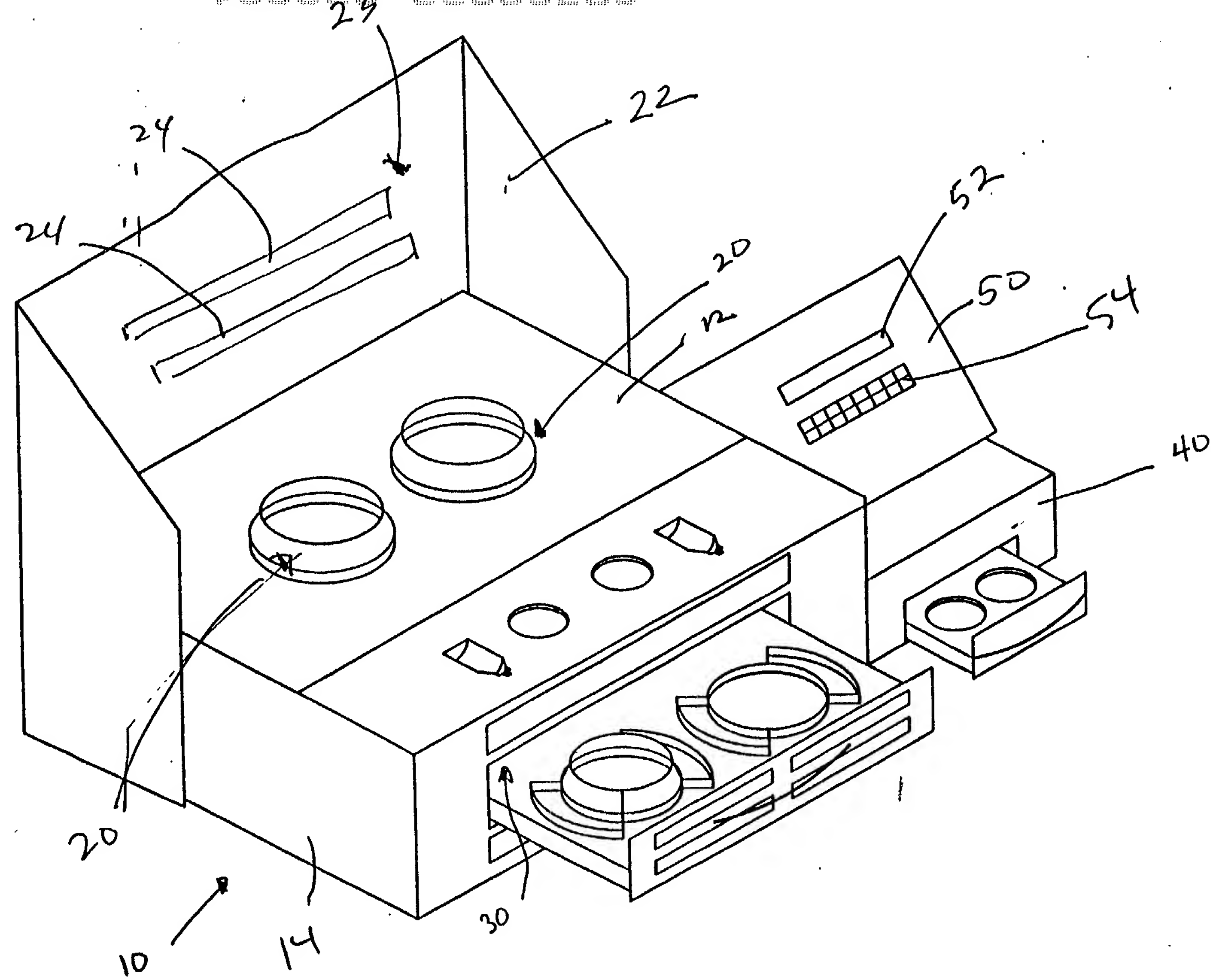


FIG. 1

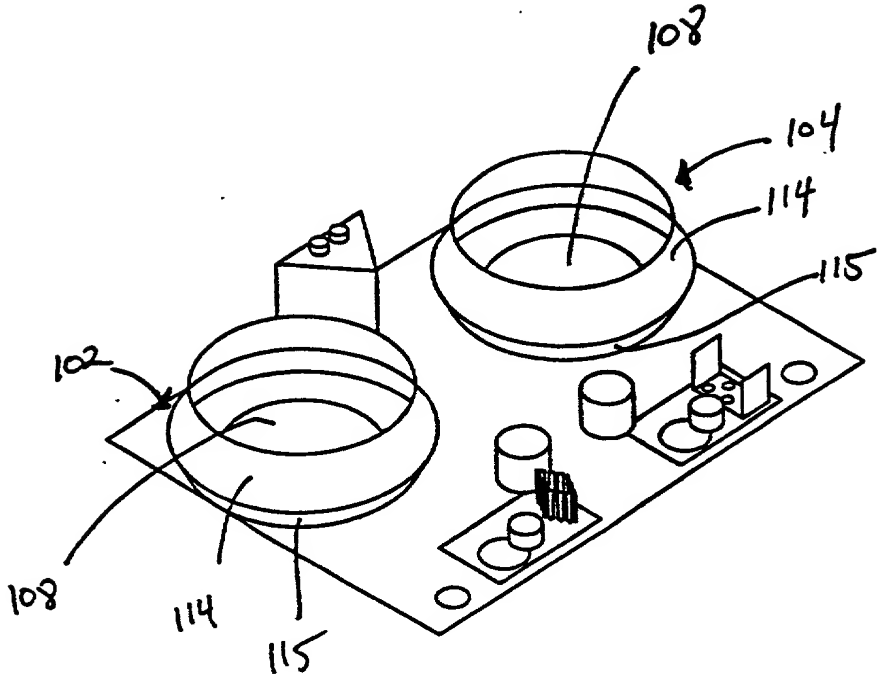


FIG. 2

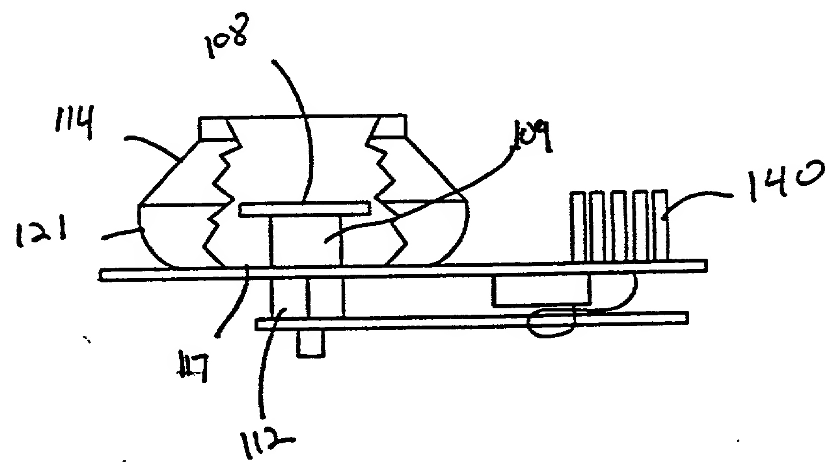


FIG. 3

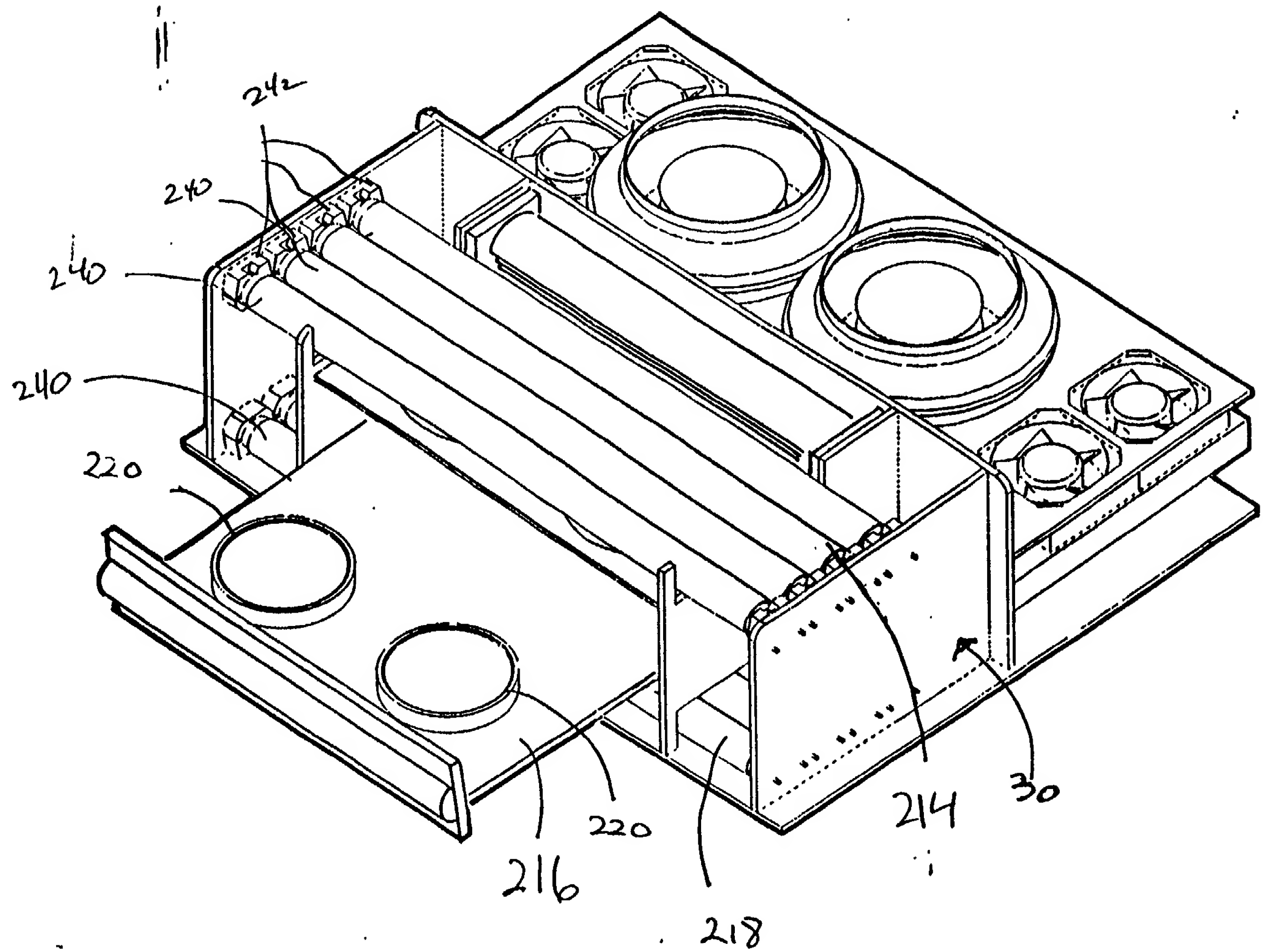


FIG. 4

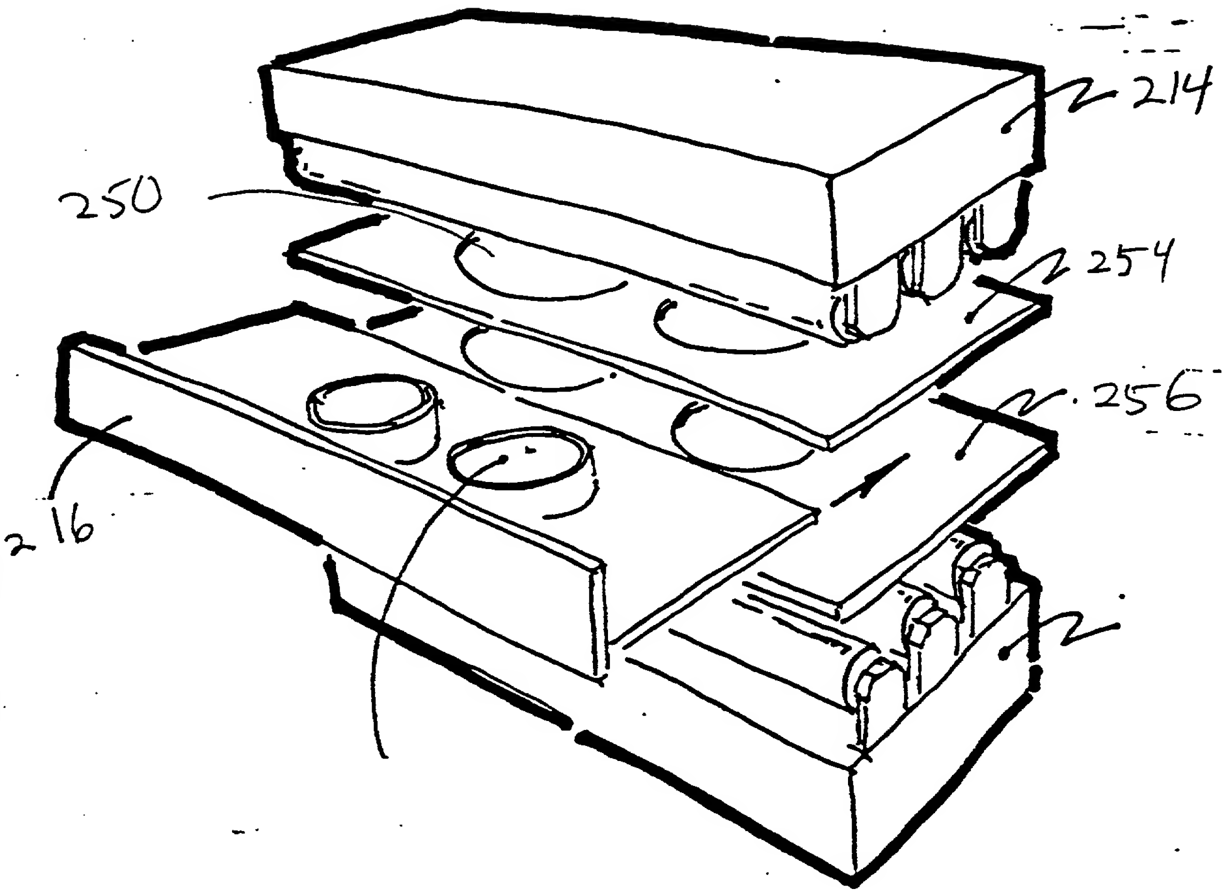


FIG. 5

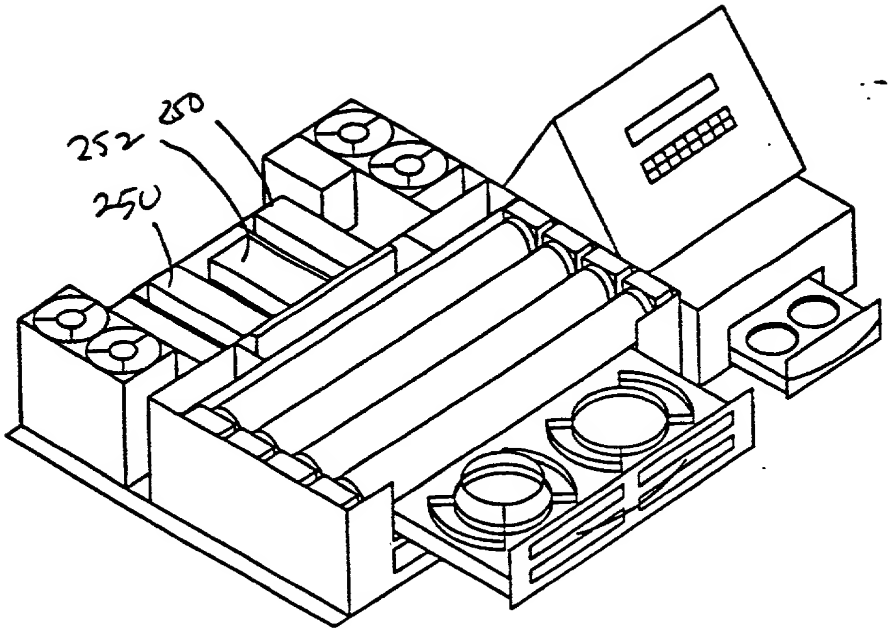


FIG. 6

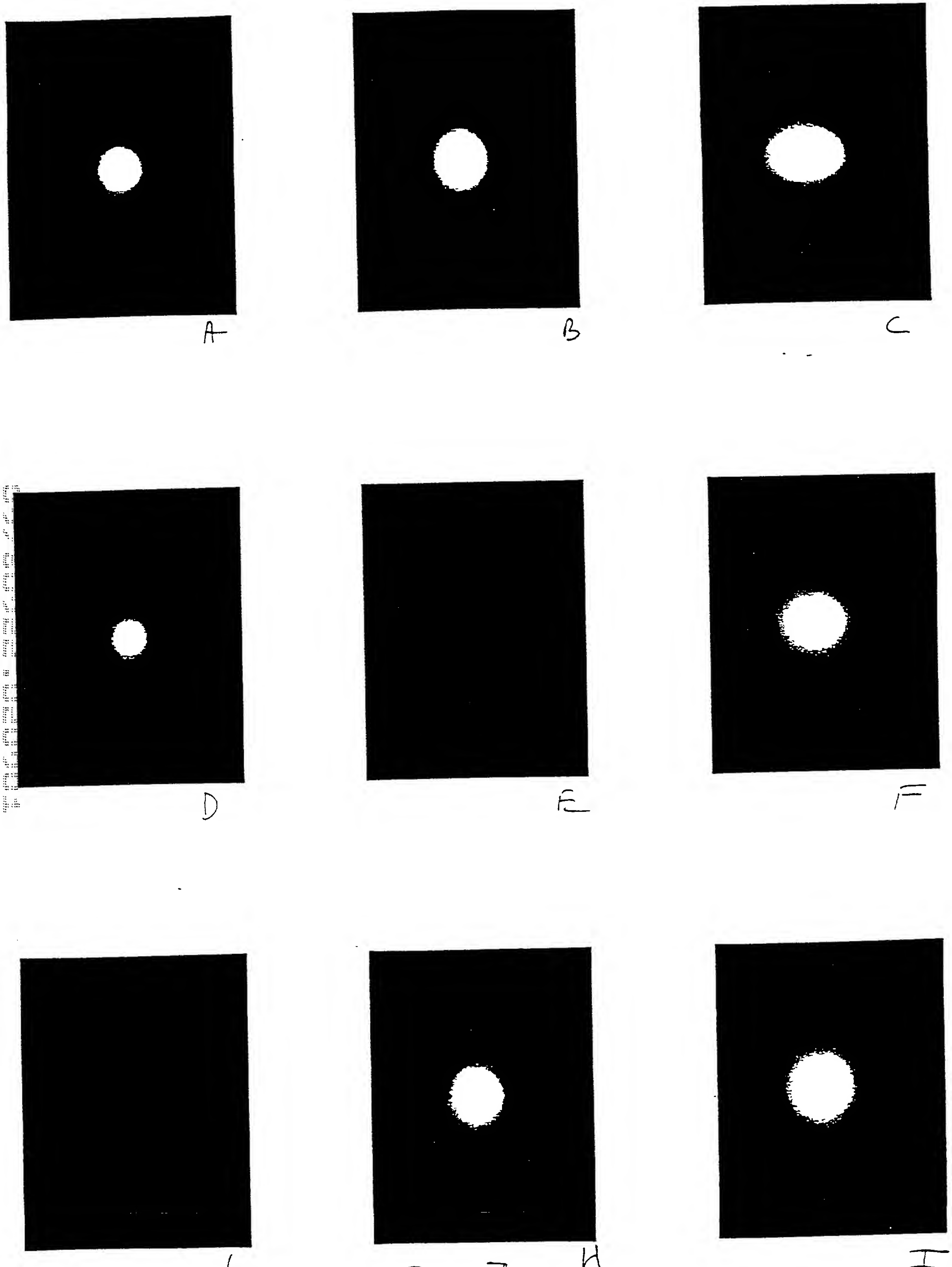


FIG 7

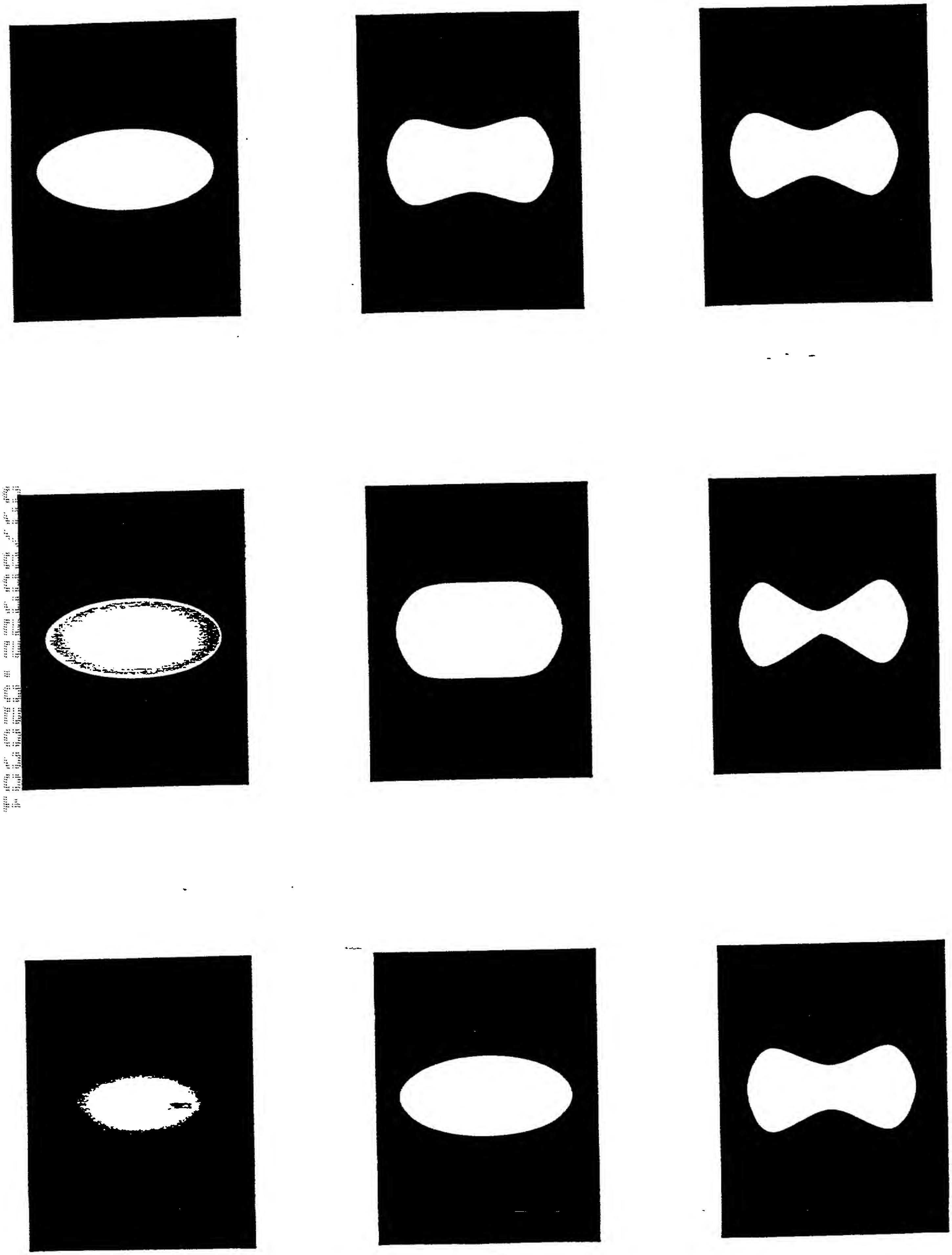


FIG 8

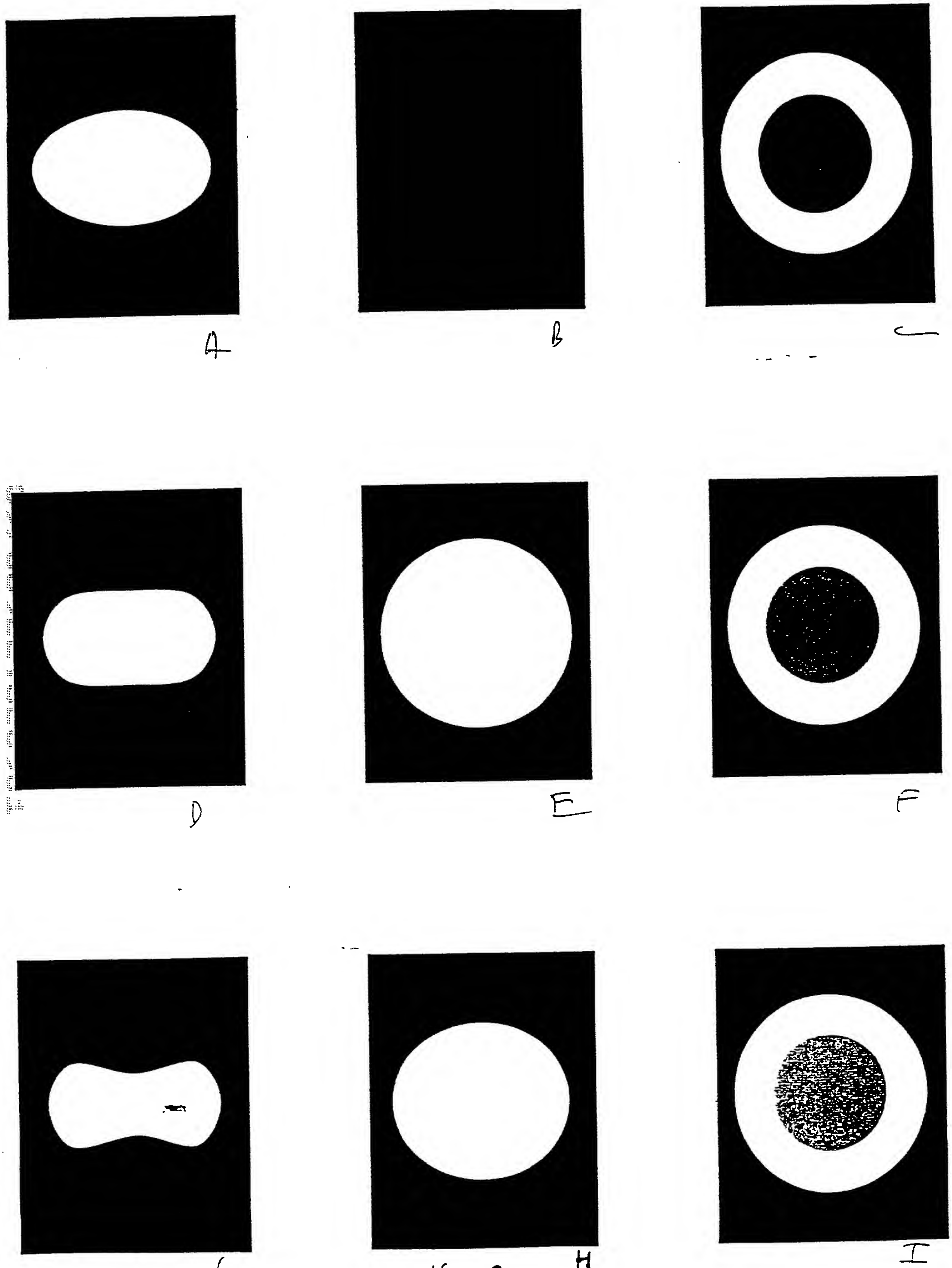


FIG. 9

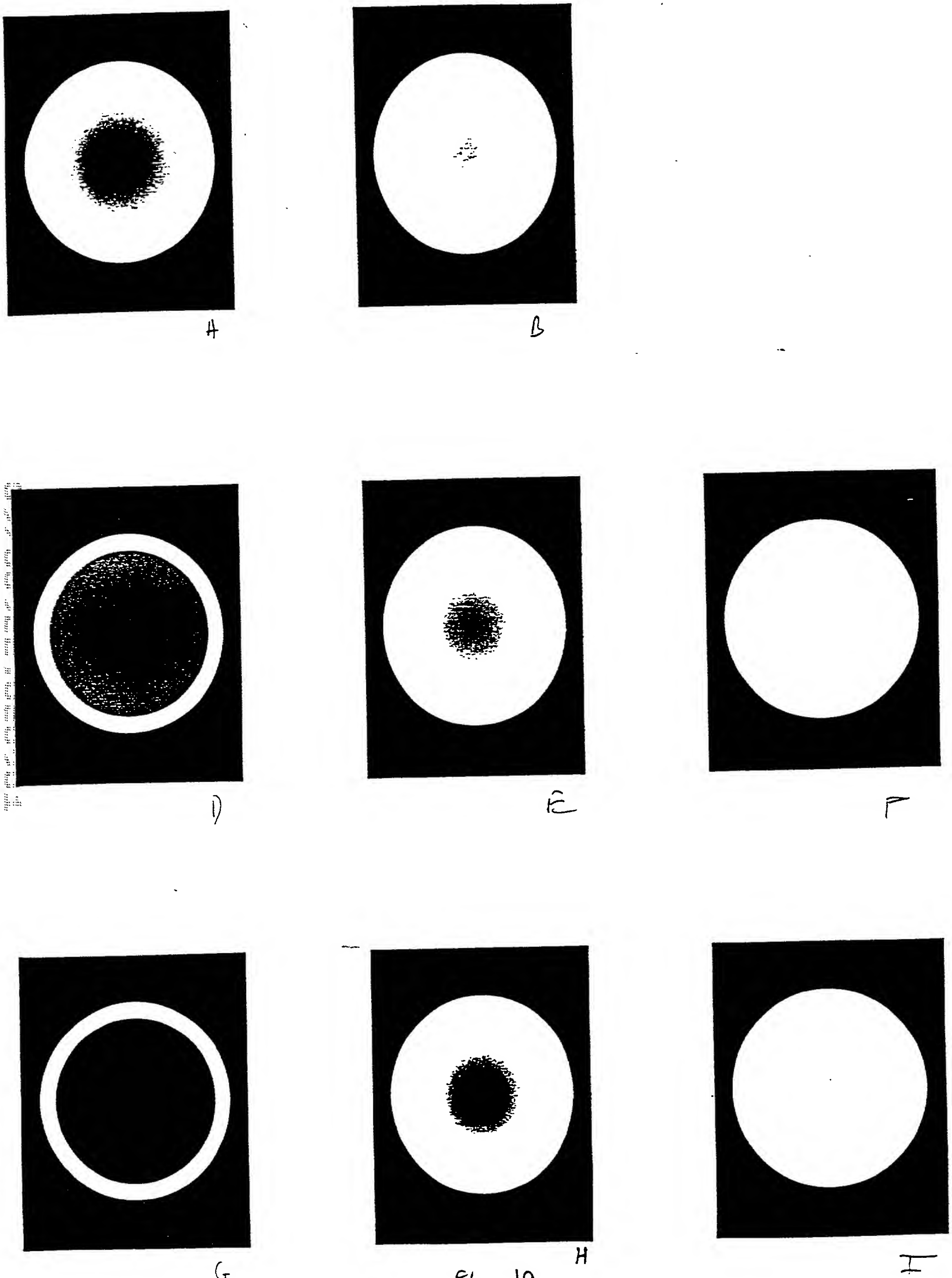


FIG. 10

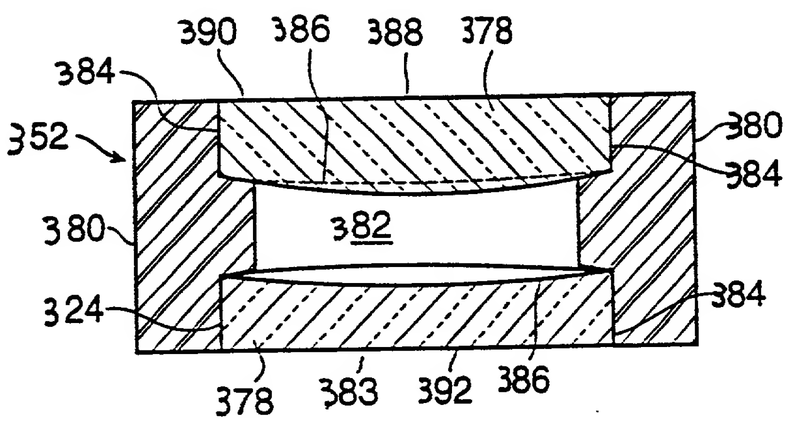


FIG. 11

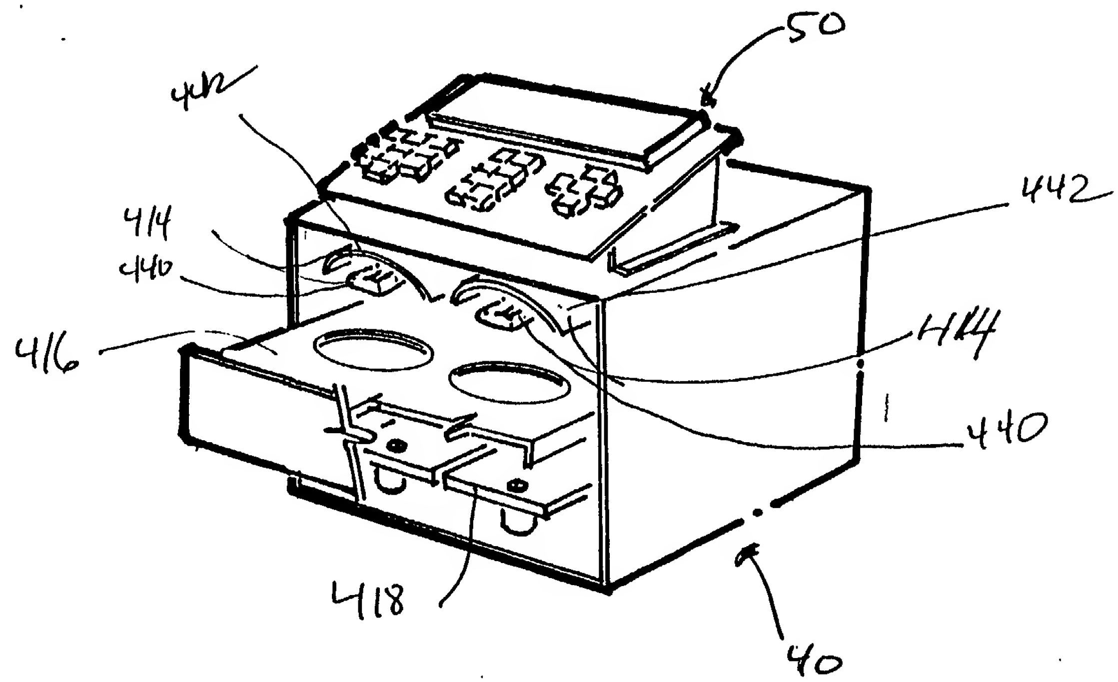


FIG. 12

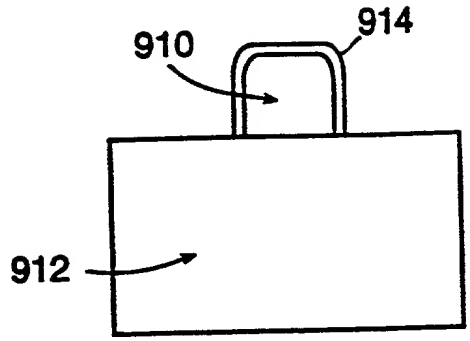


FIG. 13

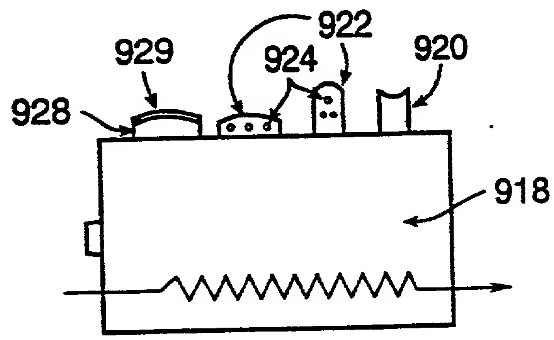


FIG. 14

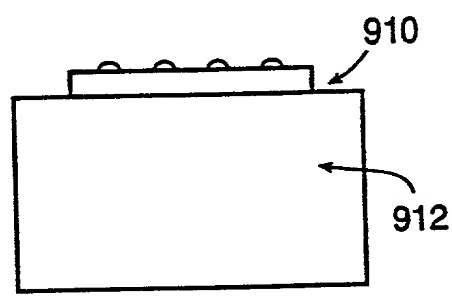


FIG. 15

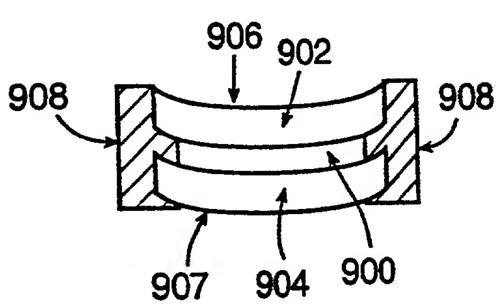
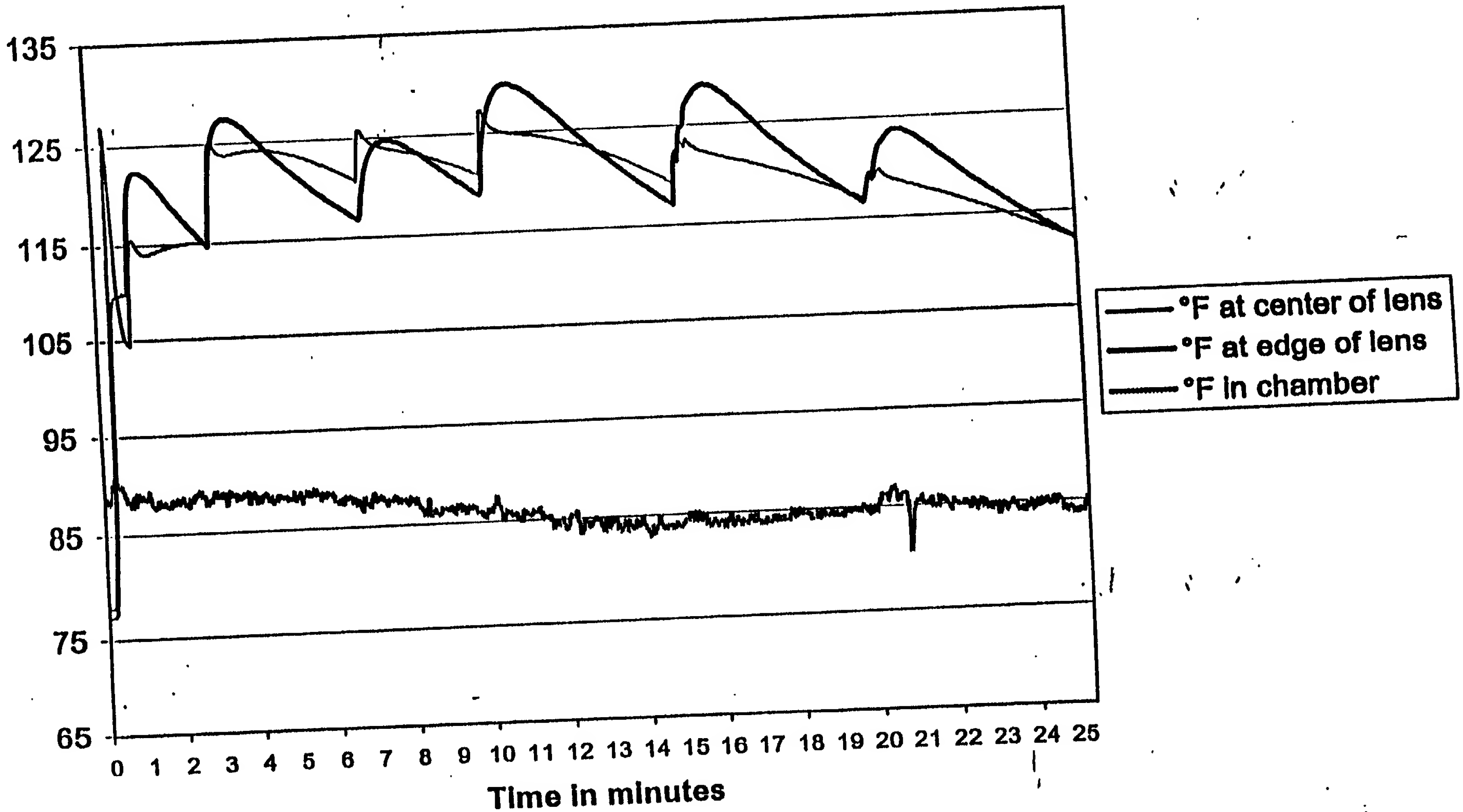


FIG. 16

Fig. 17


135
125
115
105
95
85
75
65
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Time in minutes
°F at center of lens
°F at edge of lens
°F in chamber

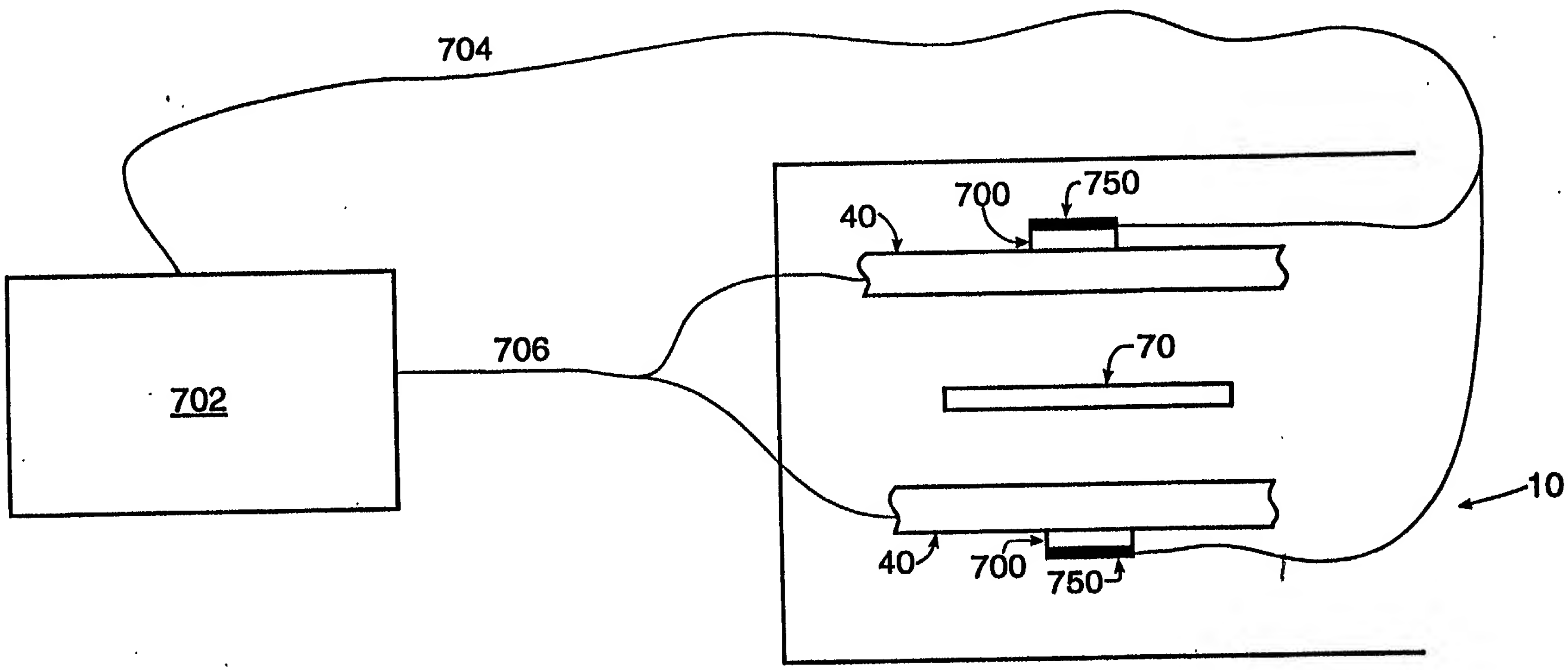


FIG. 18

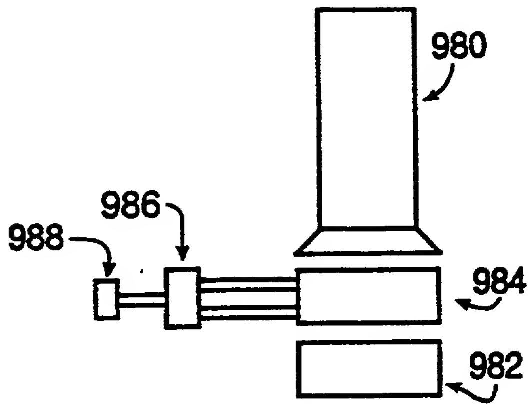


FIG. 19

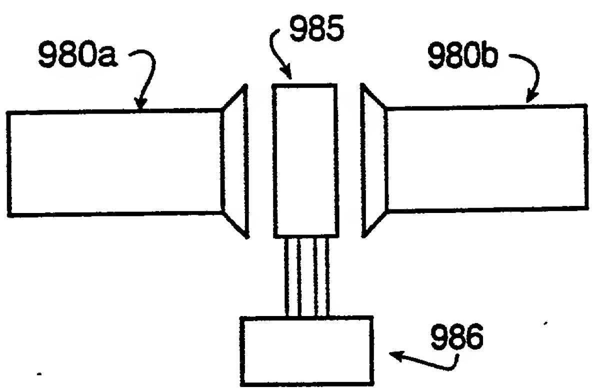


FIG. 20

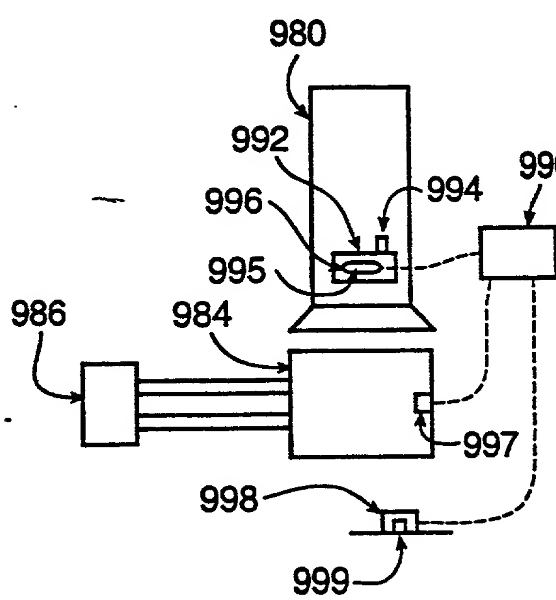


FIG. 21

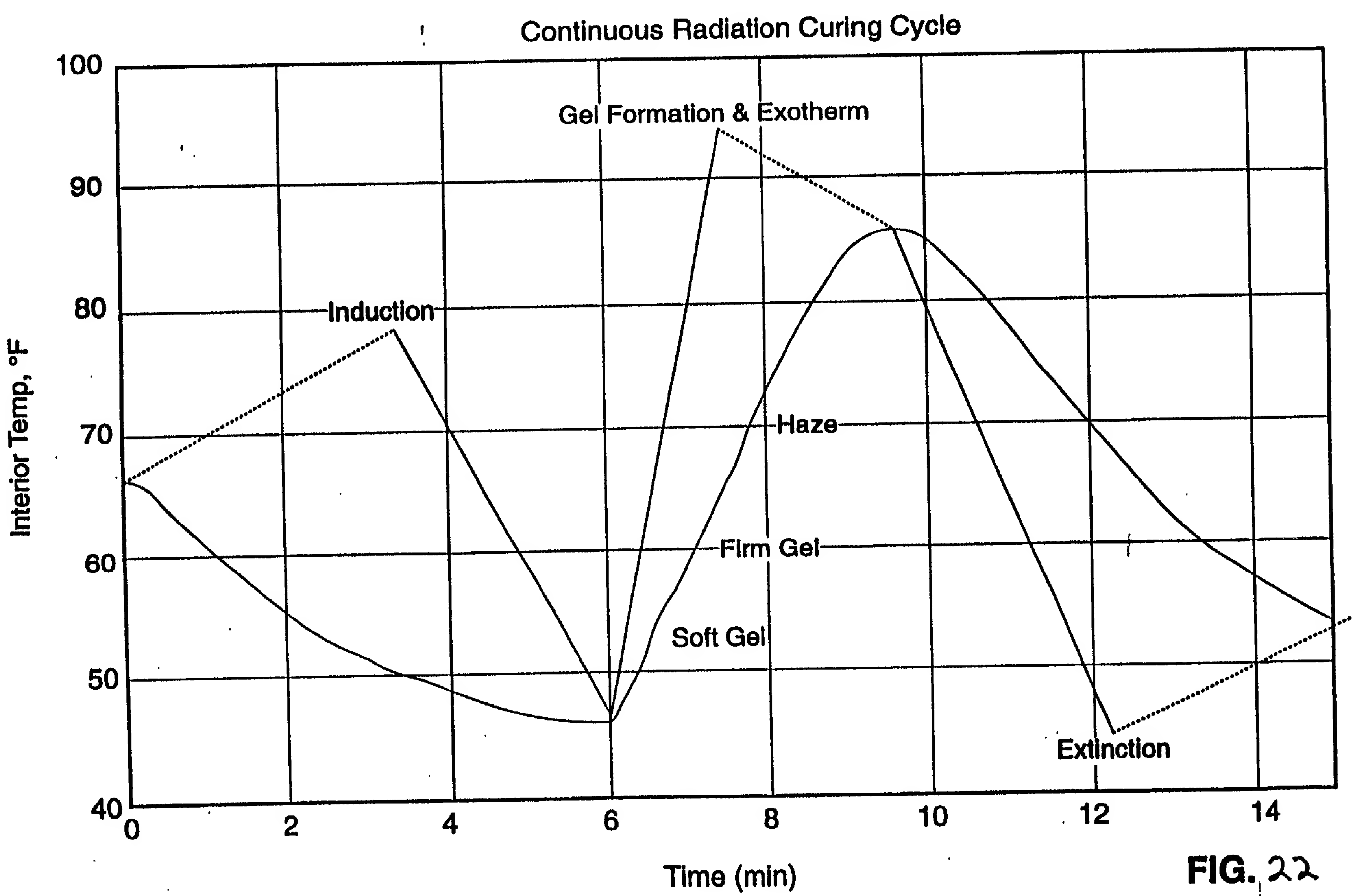
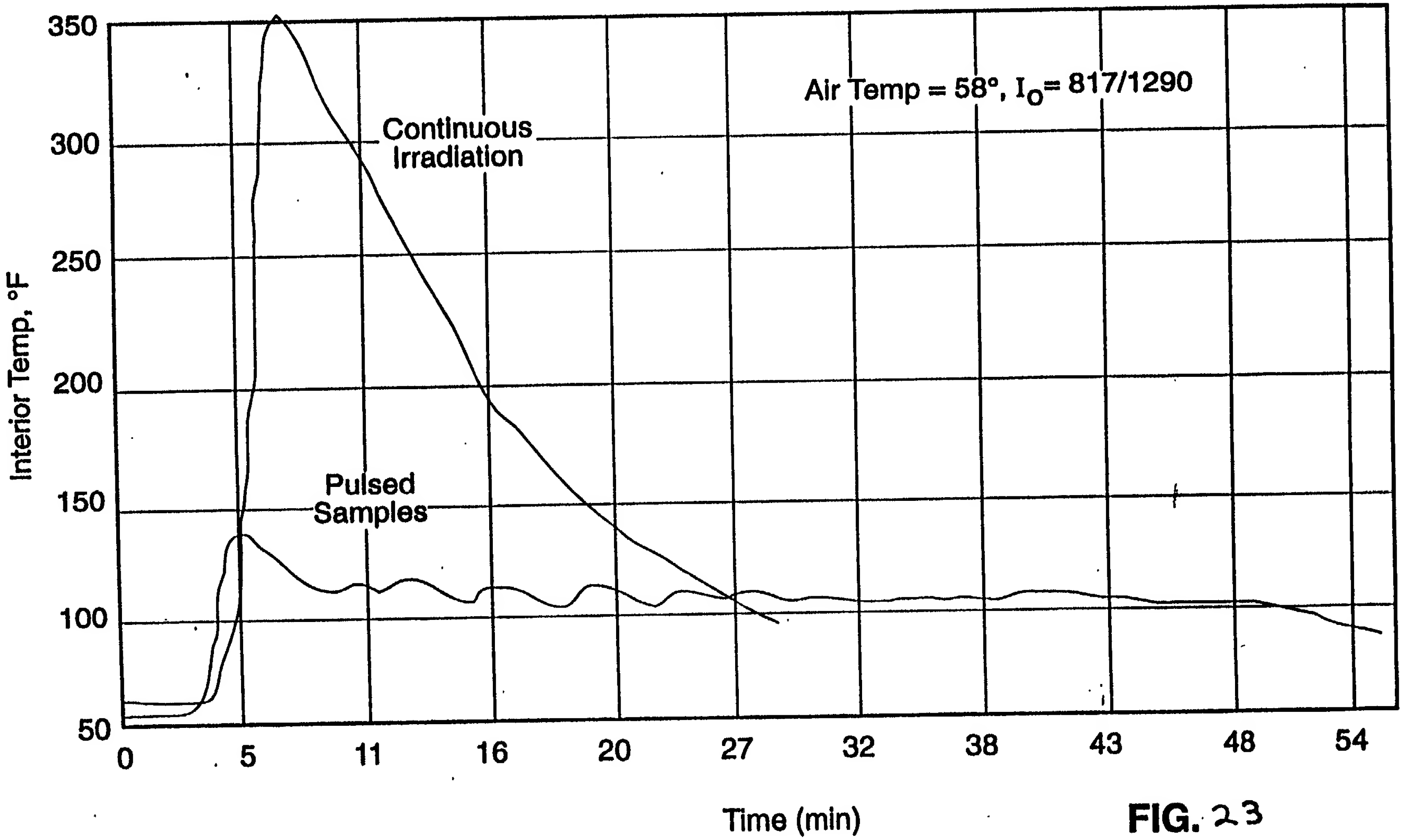

Continuous Radiation Curing Cycle
Interior Temp, °F
100
90
80
70
60
50
40
0
2
4
6
8
10
12
14
Time (min)
Induction
Gel Formation & Exotherm
Haze
Firm Gel
Soft Gel
Extinction

FIG. 22



Air Temp = 58°, I_O= 817/1290
Continuous Irradiation
Pulsed Samples
Interior Temp, °F
350
300
250
200
150
100
50
0
5
11
16
20
27
32
38
43
48
54
Time (min)

FIG. 23

FIG. 24

Interaction of Pulsed Method Variables

On this cycle variable in: / The effect that this variable will tend to have:	MASS OF SAMPLE	LIGHT INTENSITY	RATE OF COOLING	IDENTITY OF MONOMER
OPTIMAL INITIAL EXPOSURE TIME	As sample mass increases, initial exposure time may be increased. The mass of the sample interacts with light intensity to determine a preferred initial exposure time.	As light intensity increases, initial exposure time may tend to decrease. The light intensity level may be controlled for a fixed curing cycle and initial exposure time. It is believed, however, that changes in light intensities may have little impact above a certain light "saturation" point for the sample.	The rate of cooling tends to have a small impact upon the preferred initial exposure period.	Differences in inhibitor & initiator levels between batches of otherwise identical monomers may significantly affect induction periods. Various radiation curable compounds may also vary widely in their preferred initial exposure times due to inherent differences in their reactivity.
TOTAL CYCLE TIME	Increased sample mass may require increased total cycle time to dissipate the additional heat generated.	Increased light intensity may cause a decrease in the initial exposure period. It is believed, however that changes in light intensities may have little impact above a certain light "saturation" point for the sample.	Increased rates of heat removal may allow for a reduction in the time between pulses and thus total cycle time.	A significant effect that various monomers may have upon total cycle time will come from their different preferred initial exposure times.
TIMING BETWEEN PULSES	Increased sample mass may require longer periods of cooling between pulses of light. More heat tends to be generated from each pulse for larger samples, thus requiring longer time periods to remove heat.	For a given light intensity level, the duration of the pulses may be adjusted to create the desired amount of reaction. The timing between the pulses may also be so adjusted.	Increased rates of heat removal tend to allow for a reduction in the time between pulses.	The duration of the pulses may be adjusted to create the desired amount of reaction and heat generation for the for the particular lens forming material being cured. Adjusting the cooling period between pulses may also be beneficial.

Interaction of Pulsed Method Variables (continued)

The effect that this variable will tend to have:

On this cycle variable in:	MASS OF SAMPLE	LIGHT INTENSITY	RATE OF COOLING	IDENTITY OF MONOMER
TOTAL EXPOSURE TIME	Increased sample mass tends to require both increased initial exposure time and a greater number of pulse/cooling cycles.	Increased light intensity will tend to result in decreased total exposure time and decreased light intensity will tend to require increased exposure time. It is believed, however, that changes in light intensities may have little impact above a certain light "saturation" point for the sample.	There is only a small relationship between the total dosage of light a particular mass sample requires to polymerize and the rate at which it is being cooled.	A significant effect that monomer identify may have on total cycle time may be contributed by differences in the preferred initial exposure period. Various lens forming materials may also require longer/shorter duration pulses depending upon their reactivity.
DURATION OF PULSES	The length of the pulses during each phase of the curing cycle may be adjusted for different mass samples. The time between pulses may be increased /decreased according to mass.	The duration of the pulses may be varied in inverse proportion with the light intensity selected. It is believed, however that changes in light intensities may have little impact above a certain light "saturation" point for the sample.	A pulse will tend to generate a certain amount of heat to be dissipated. Since the pulse duration tends to be small relative to the time between pulses when the heat is being removed, changes in the rate of heat removal should not significantly affect the ideal pulse duration.	Various lens forming materials require different pulse duration depending upon their reactivity. For a selected material, slight differences in initiator & inhibitor levels will not tend to affect pulse duration.

FIG. 24
(continued)

FIG. 25

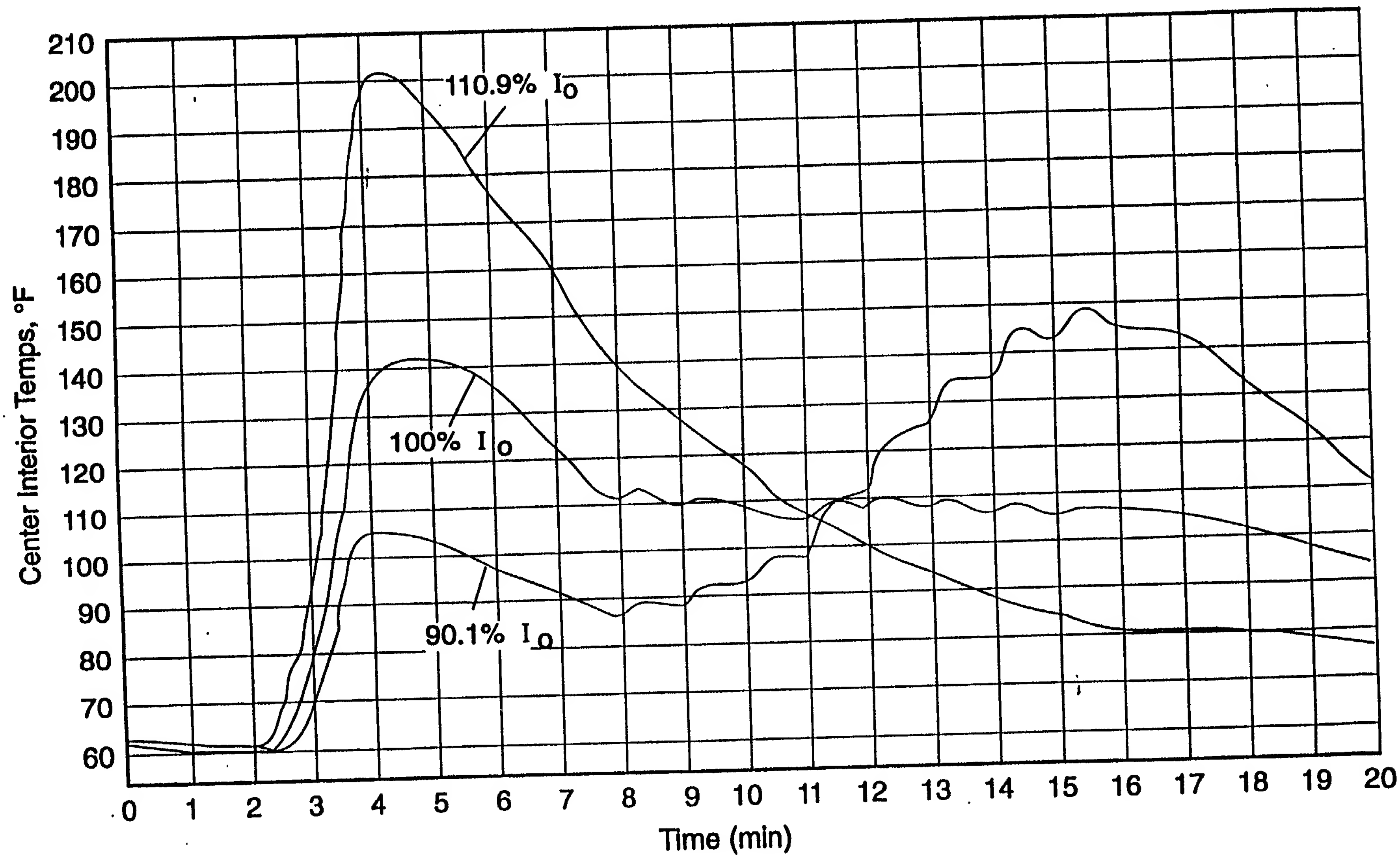

110.9% I_o
100% I_o
90.1% I_o
Center Interior Temps, °F
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Time (min)

FIG. 26

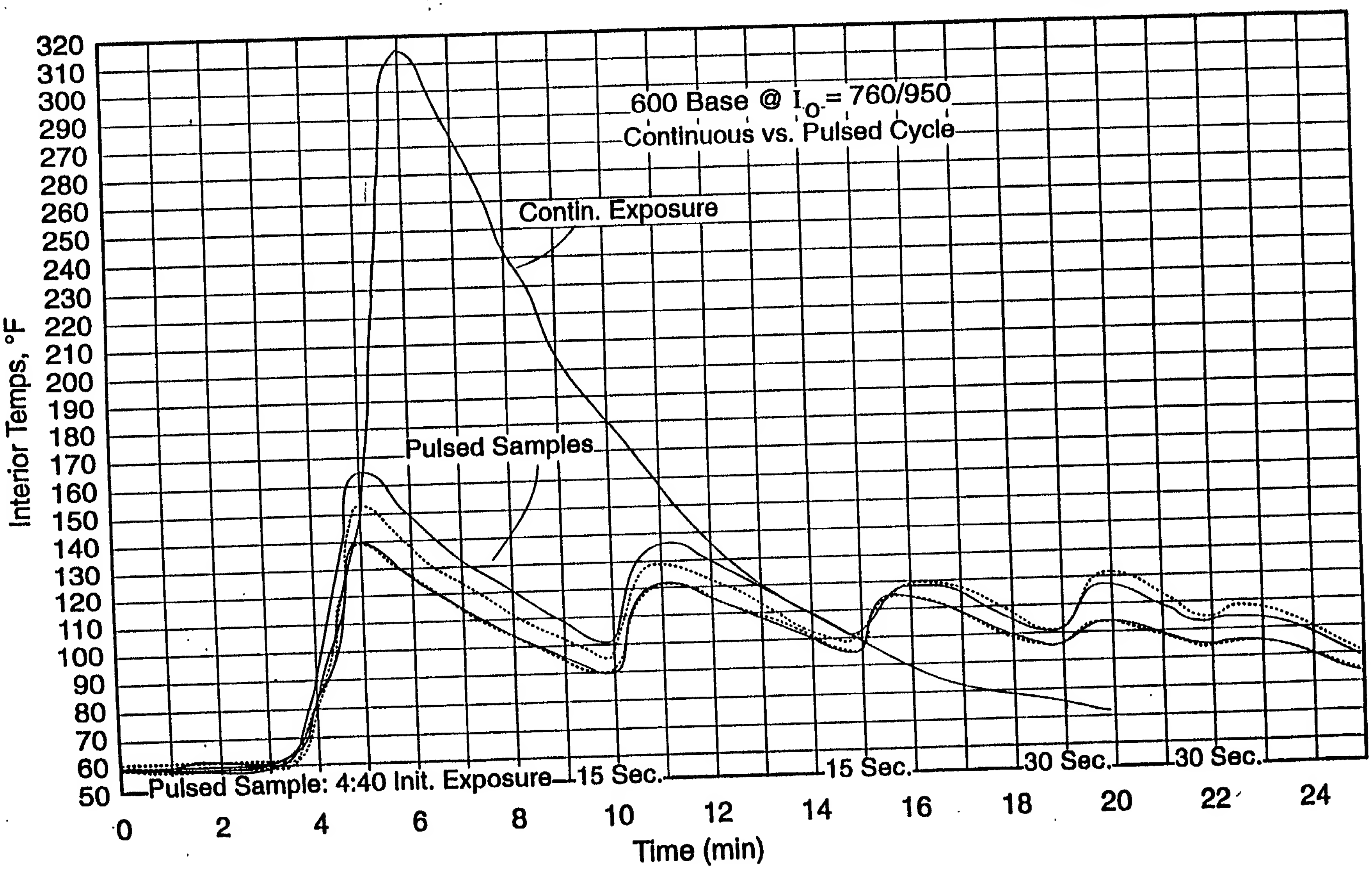
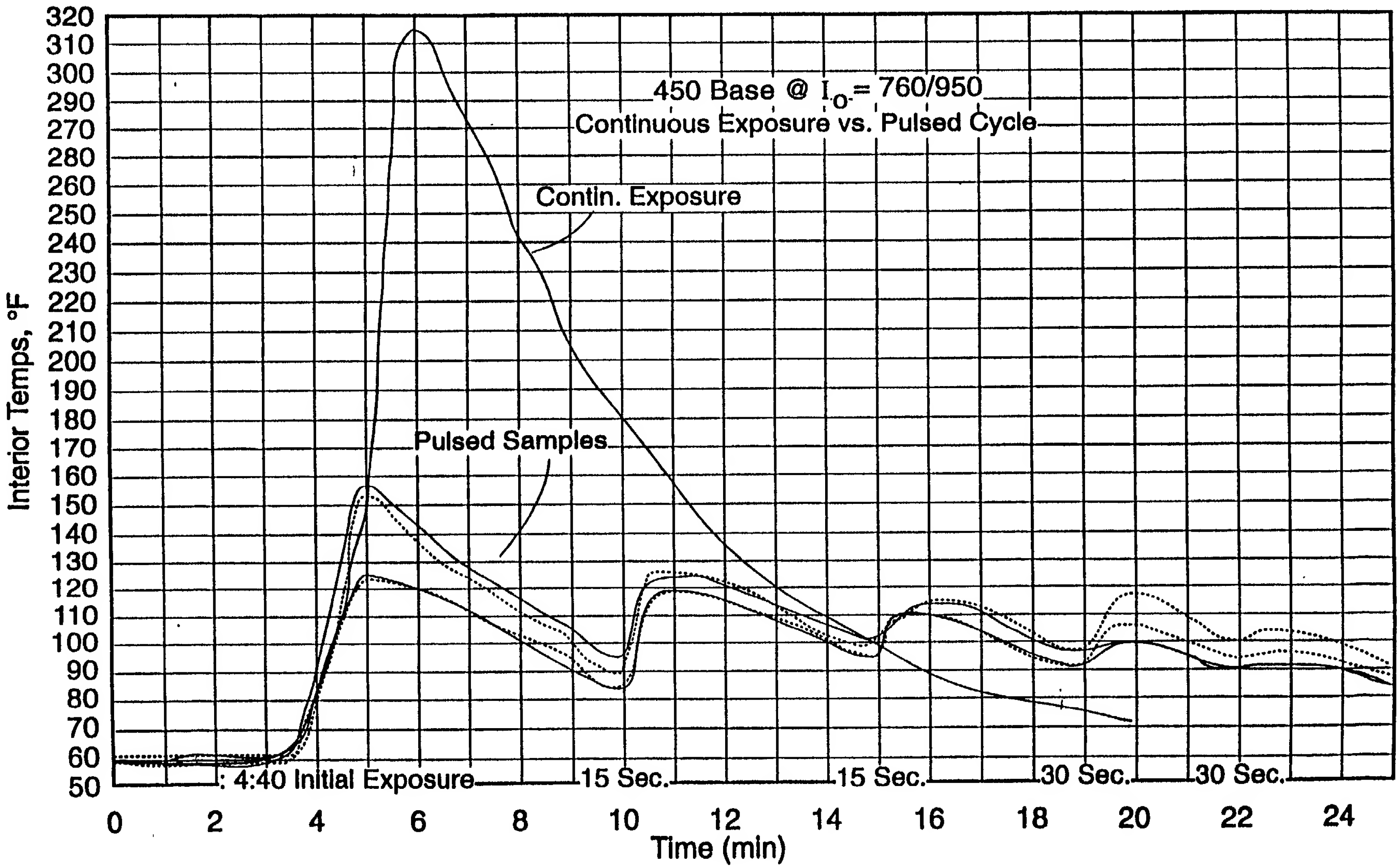
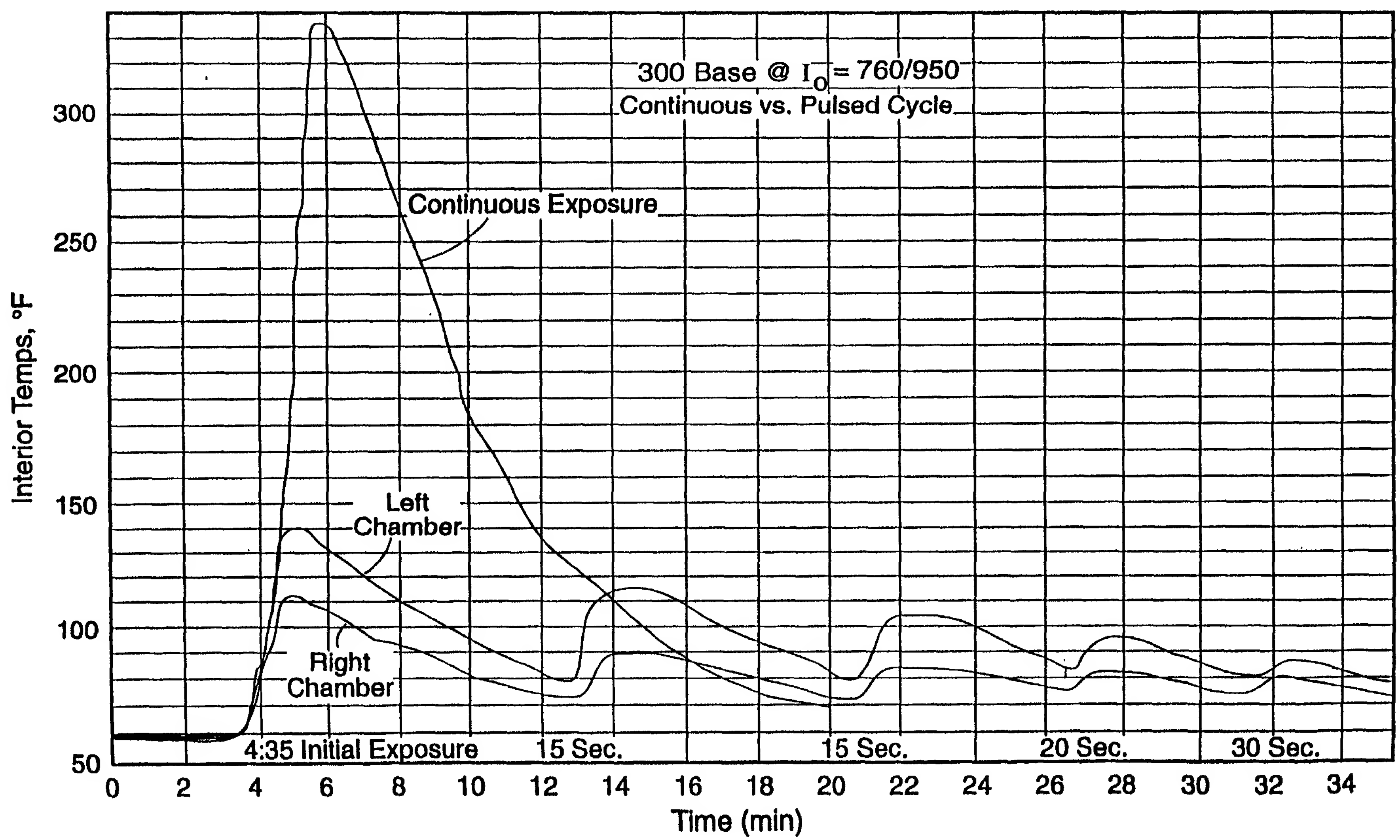

600 Base @ I_O = 760/950
Continuous vs. Pulsed Cycle
Contin. Exposure
Pulsed Samples
Interior Temps, °F
320
310
300
290
270
280
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
Pulsed Sample: 4:40 Init. Exposure
15 Sec.
15 Sec.
30 Sec.
30 Sec.
0
2
4
6
8
10
12
14
16
18
20
22
24
Time (min)

FIG. 27



450 Base @ I_o = 760/950
Continuous Exposure vs. Pulsed Cycle
Contin. Exposure
Pulsed Samples
Interior Temps, °F
320
310
300
290
270
280
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
: 4:40 Initial Exposure
15 Sec.
15 Sec.
30 Sec.
30 Sec.
0
2
4
6
8
10
12
14
16
18
20
22
24
Time (min)

FIG. 28


300 Base @ I_0 = 760/950
Continuous vs. Pulsed Cycle
Continuous Exposure
Left Chamber
Right Chamber
4:35 Initial Exposure
15 Sec.
15 Sec.
20 Sec.
30 Sec.
Interior Temps, °F
300
250
200
150
100
50
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
Time (min)

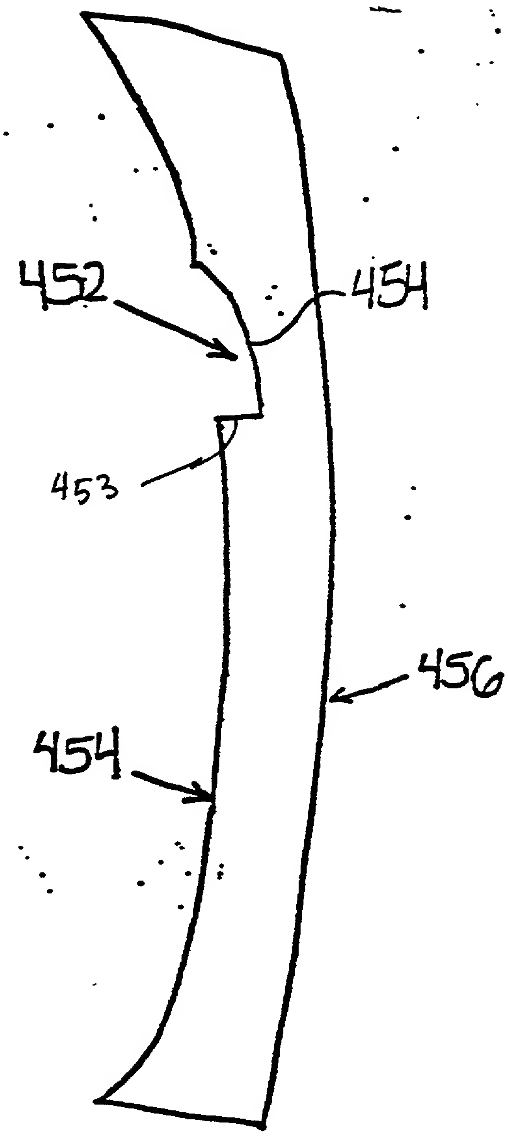


FIG. 29

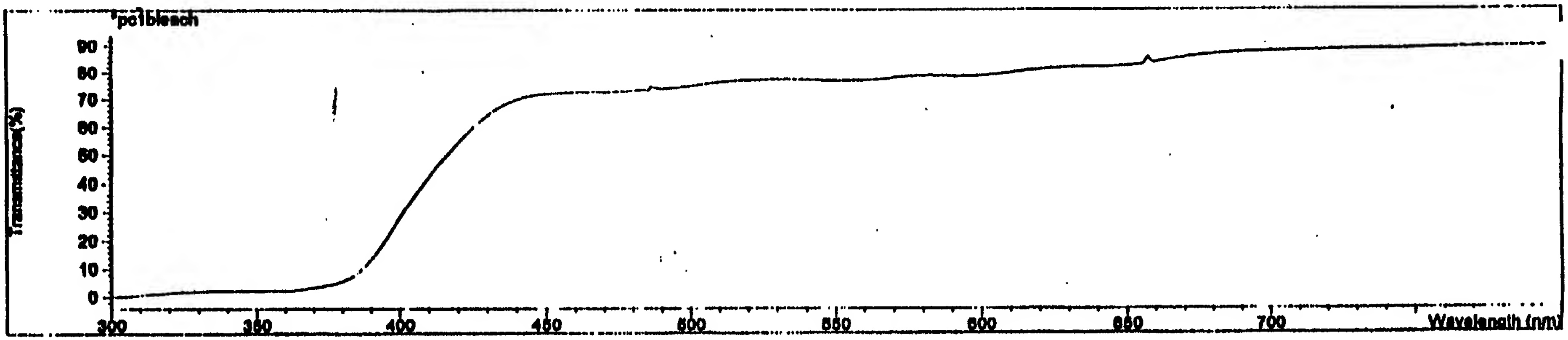

pc1bleach
Transmittance(%)
90
80
70
60
50
40
30
20
10
0
300
350
400
450
500
550
600
650
700
Wavelength (nm)

FIG. 30

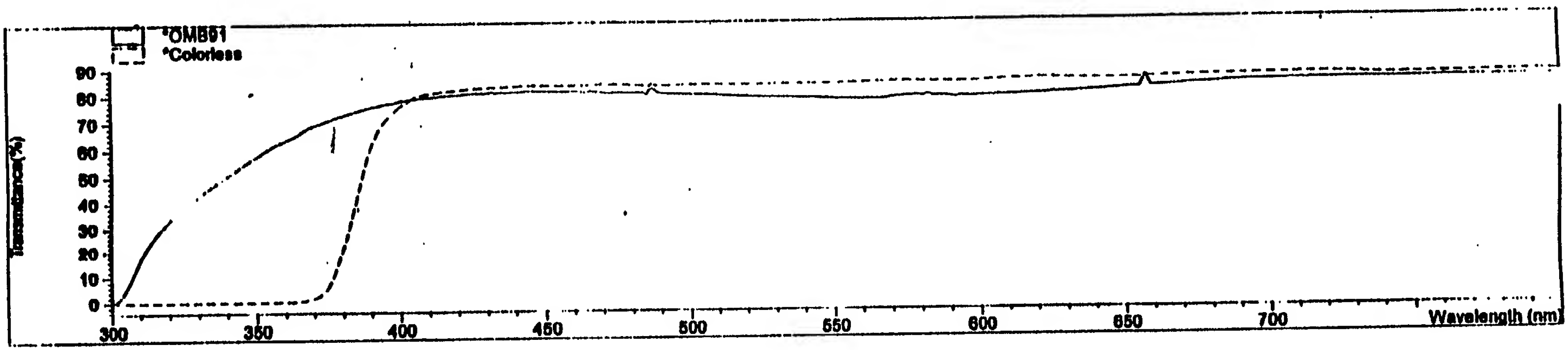

OMB91
Colorless
Transmittance(%)
90
80
70
60
50
40
30
20
10
0
300
350
400
450
500
550
600
650
700
Wavelength (nm)

FIG. 31

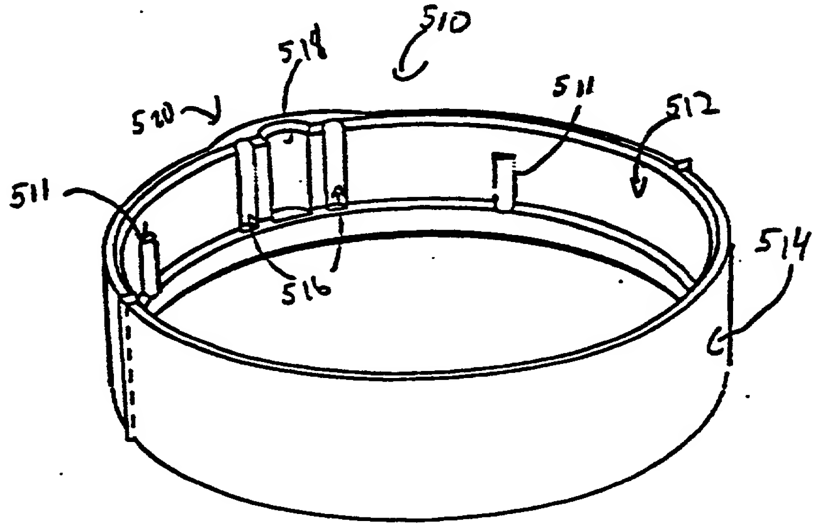

510
518
520
511
511
512
514
516

Fig. 32

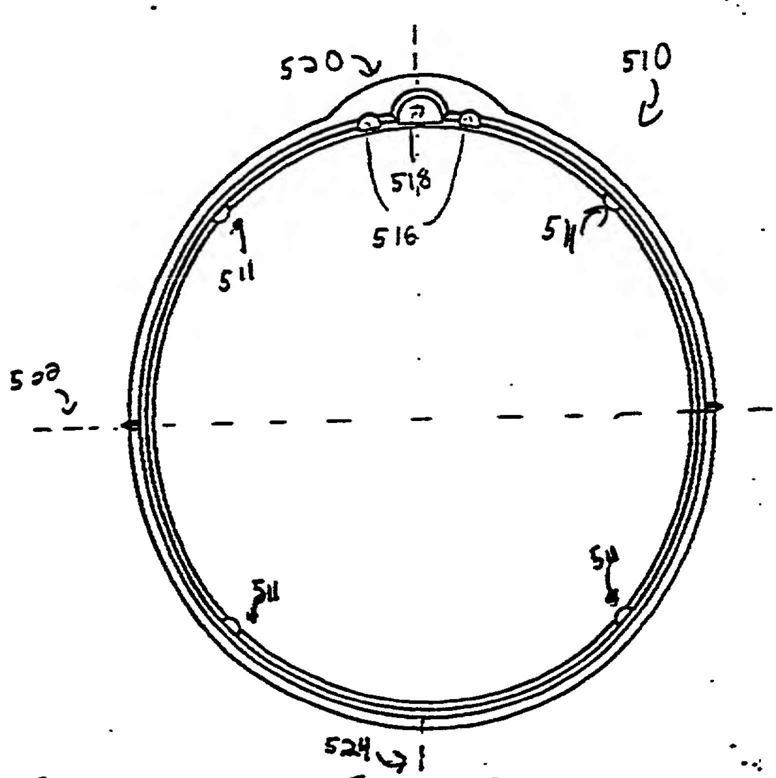

520
510
518
516
511
511
522
511
511
524

Fig. 33

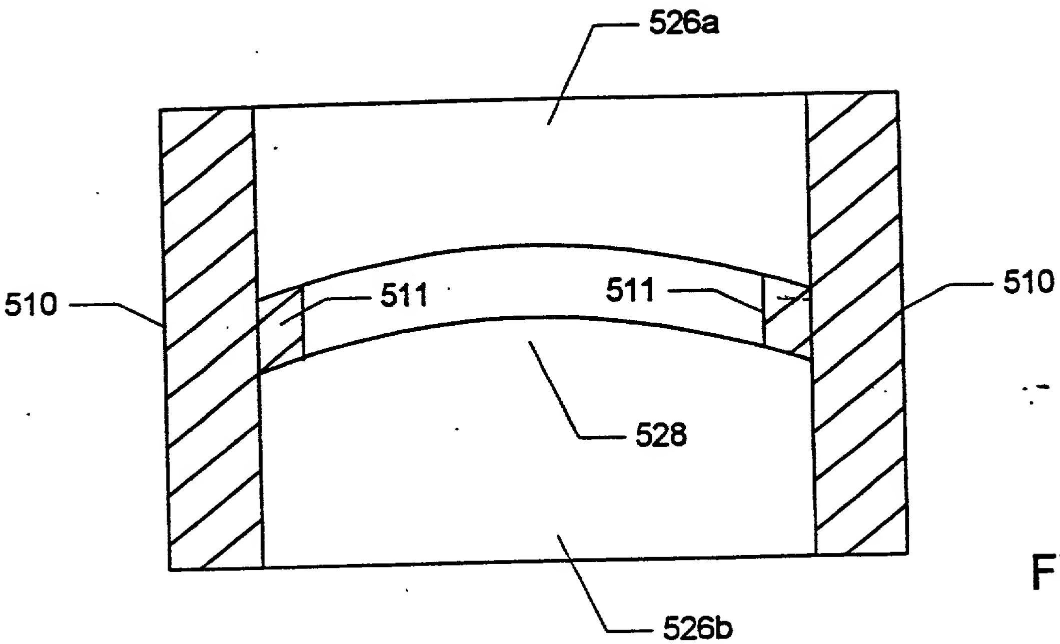


Fig. 34

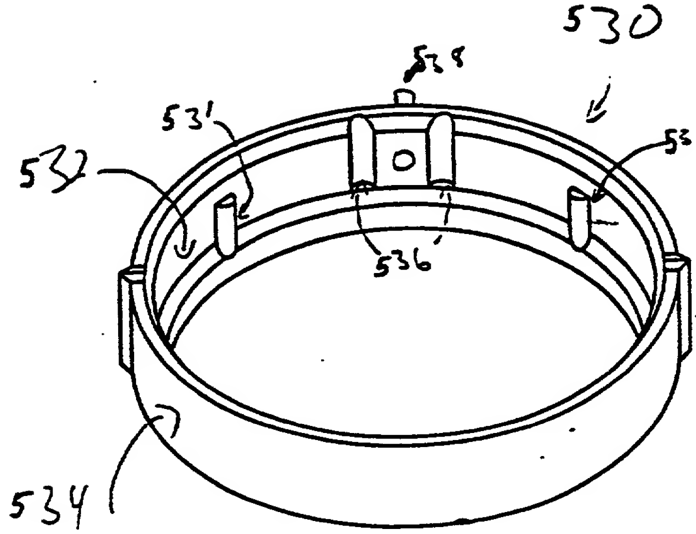


Fig. 35

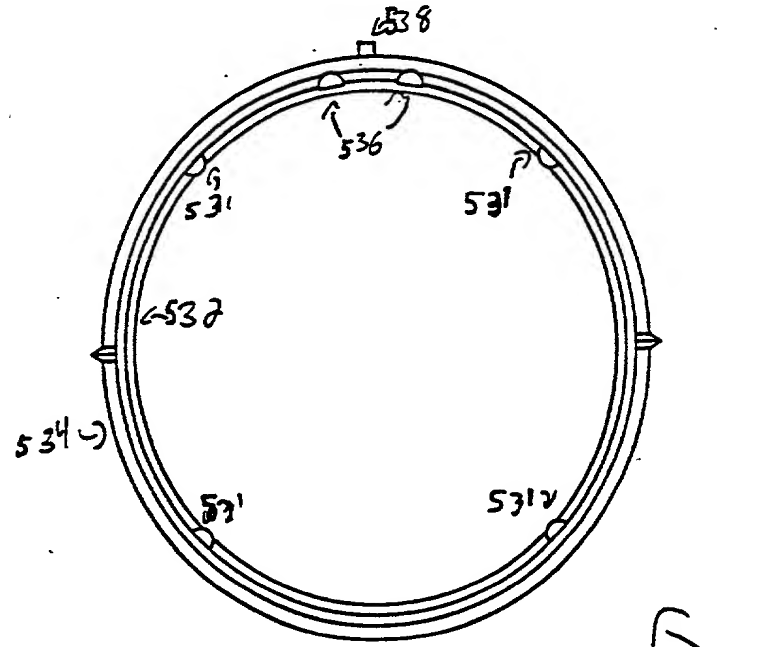
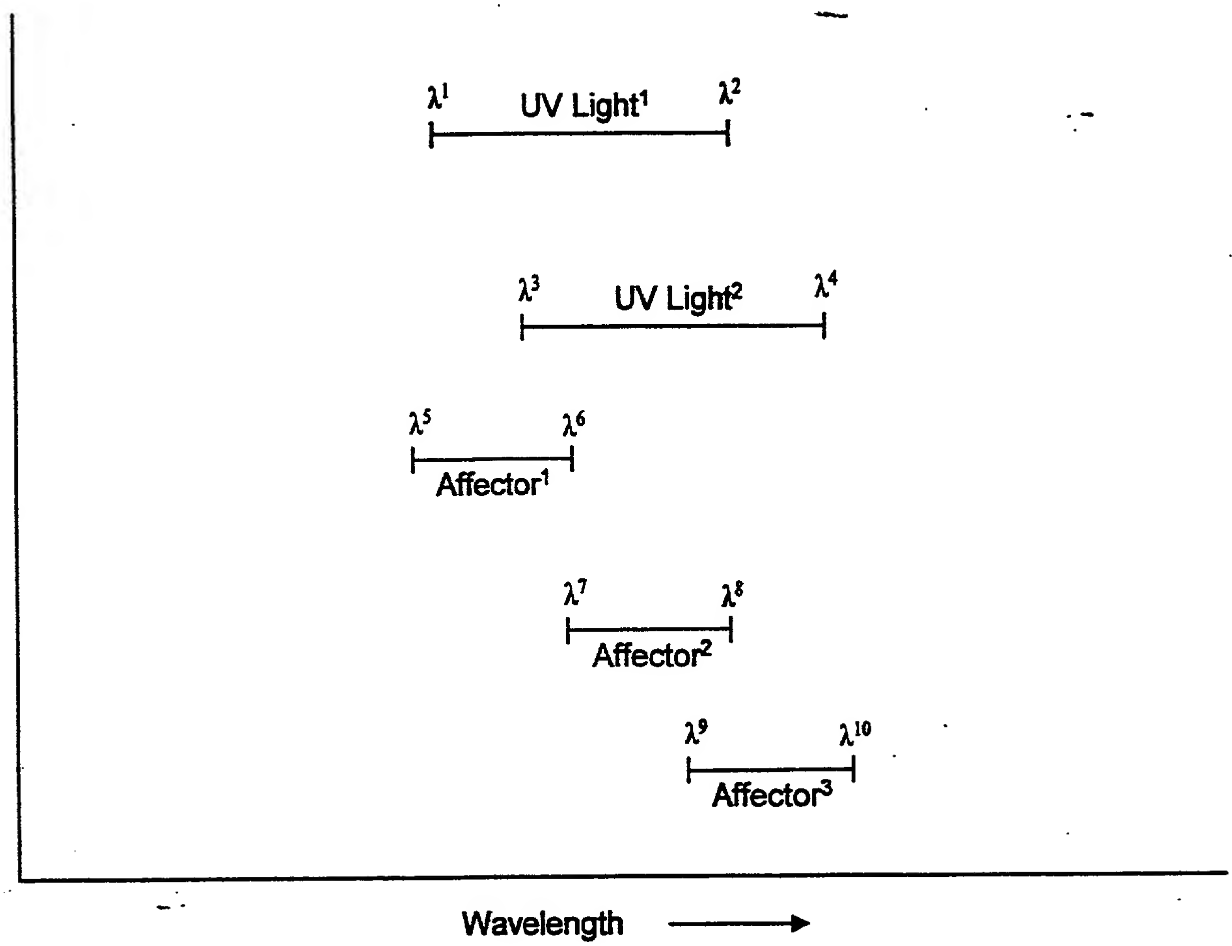


Fig. 36



λ1
UV Light1
λ2
λ3
UV Light2
λ4
λ5
λ6
Affector1
λ7
λ8
Affector2
λ9
λ10
Affector3
Wavelength

FIG. 37

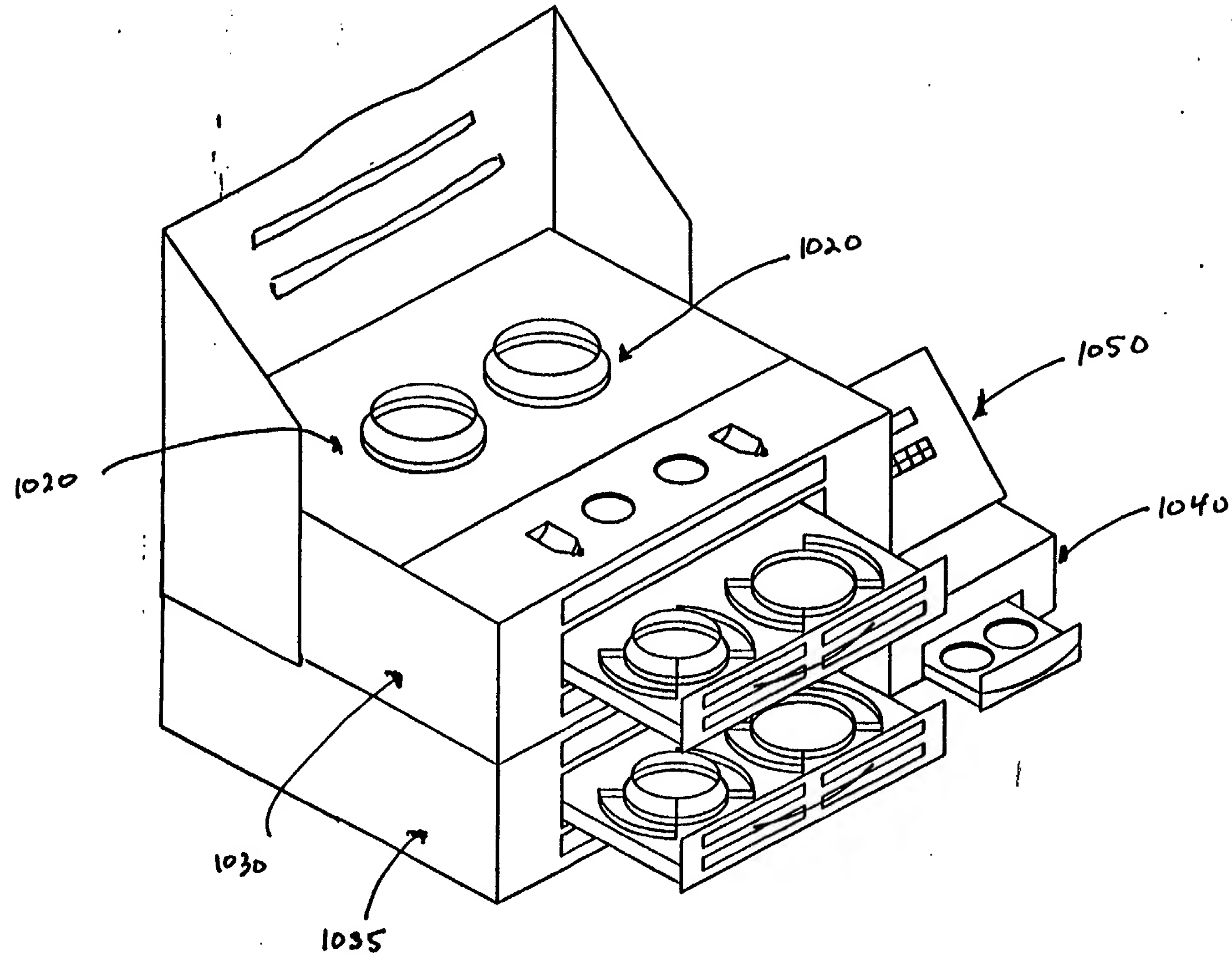
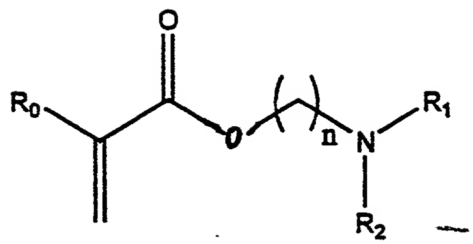
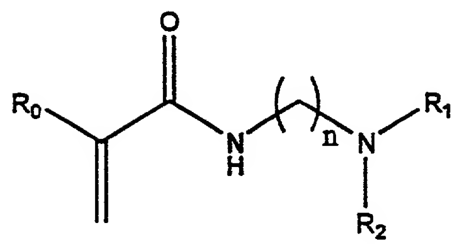


FIG. 38

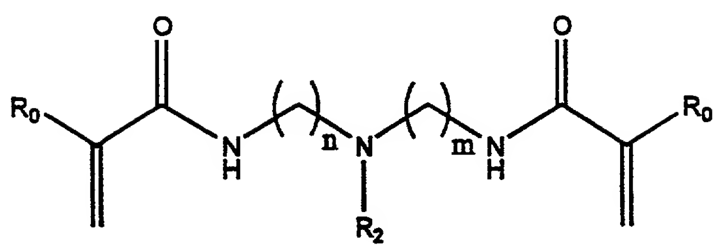
(A)



(B)



(C)



(D)

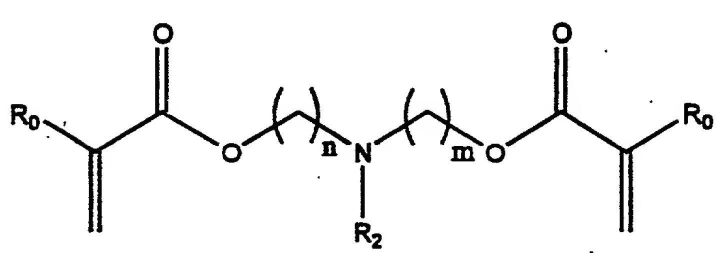


FIG. 39

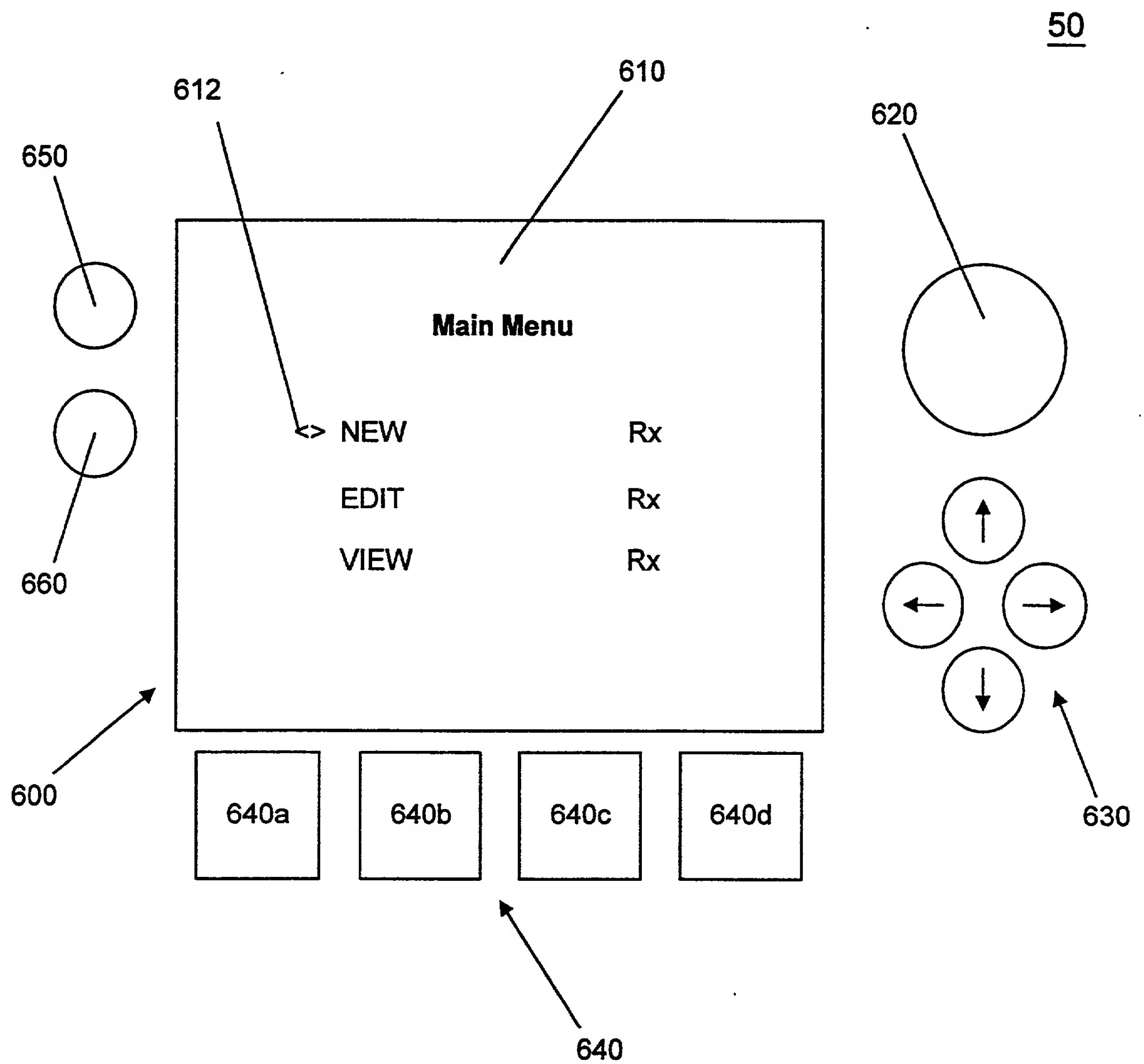
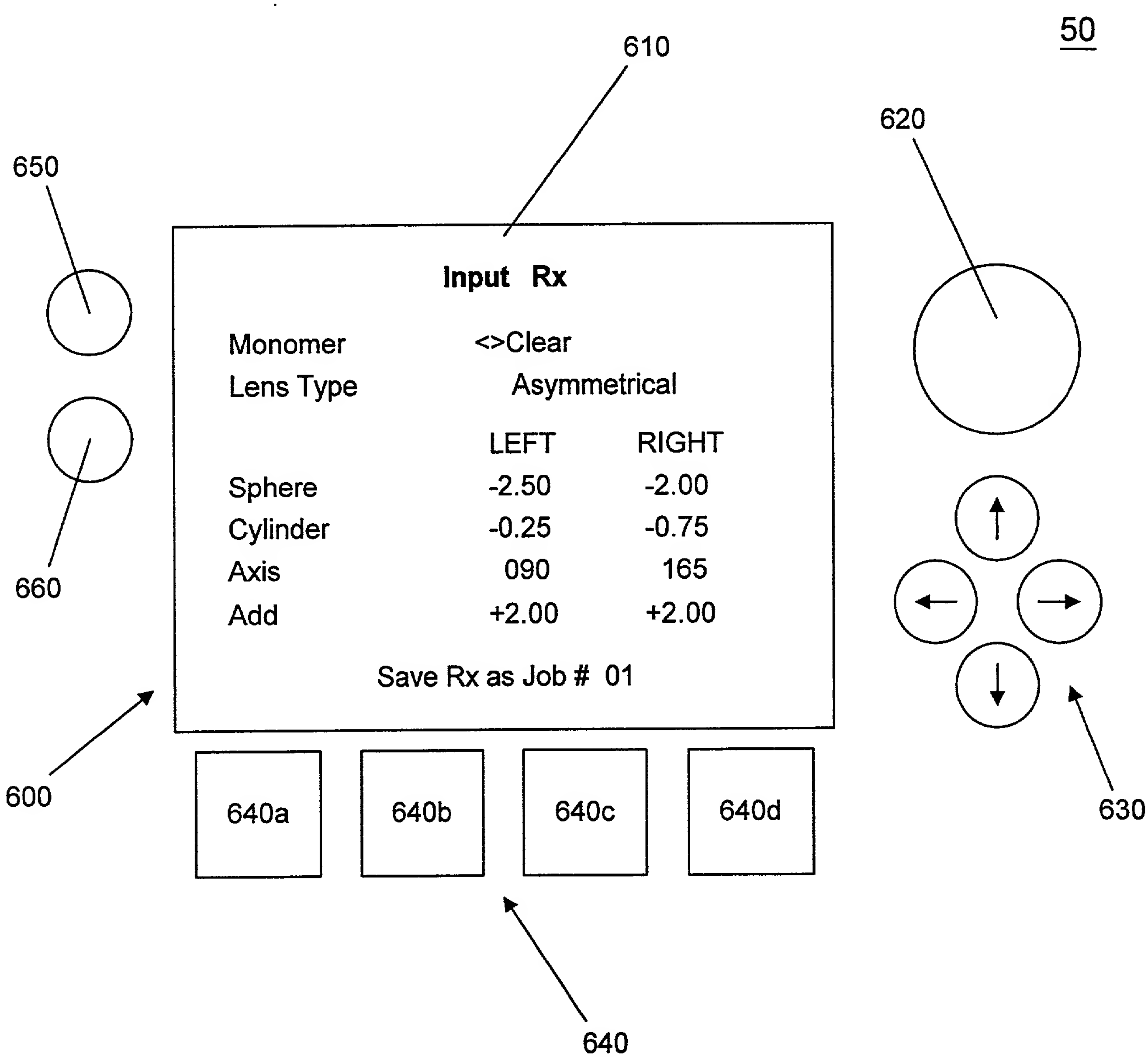
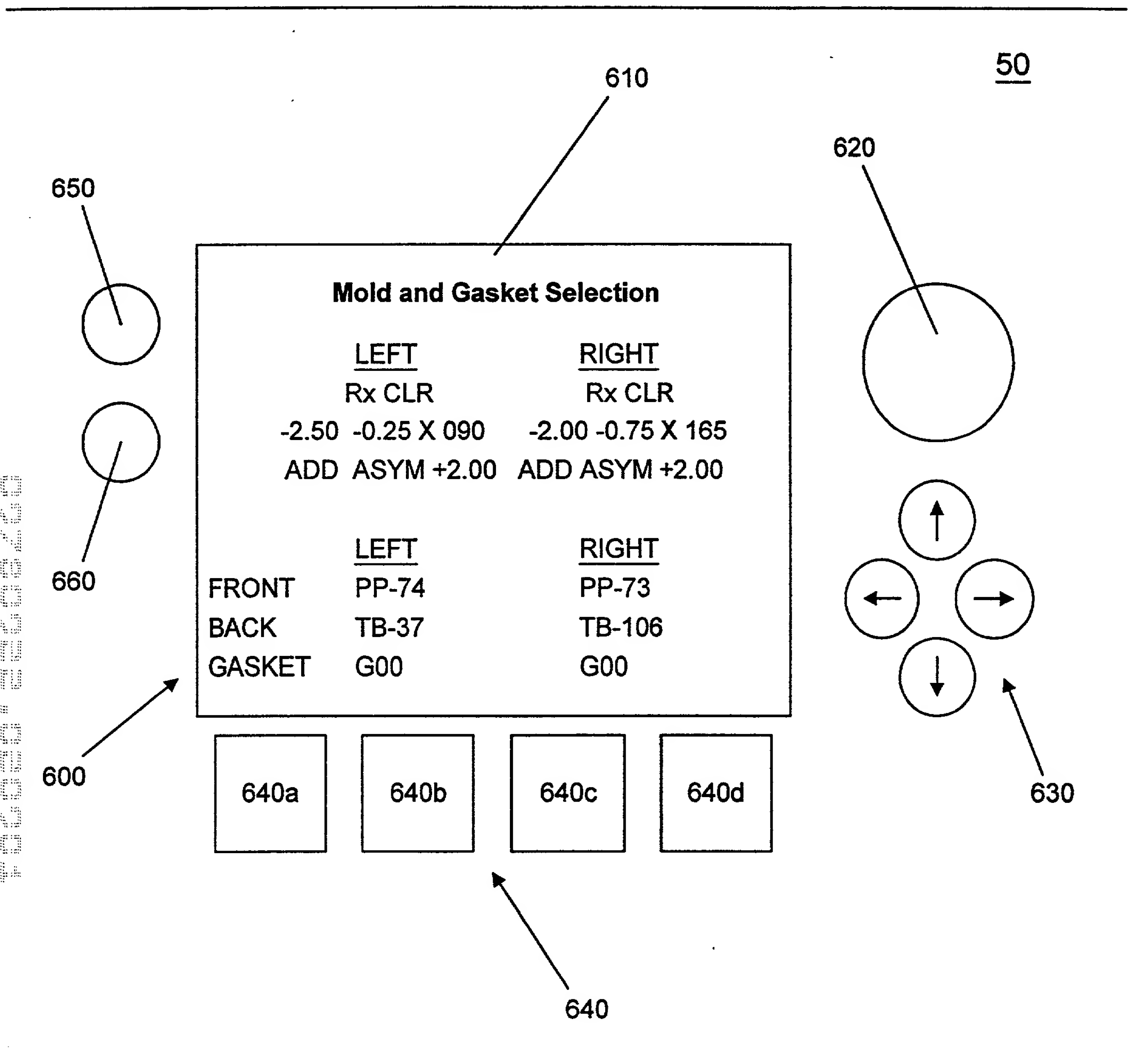

50
612
610
620
650
Main Menu
<> NEW
Rx
EDIT
Rx
VIEW
Rx
660
600
640a
640b
640c
640d
630
640

FIG. 40



50
610
620
650
Input Rx
Monomer
<>Clear
Lens Type
Asymmetrical
LEFT
RIGHT
Sphere
-2.50
-2.00
Cylinder
-0.25
-0.75
Axis
090
165
Add
+2.00
+2.00
660
Save Rx as Job # 01
600
640a
640b
640c
640d
630
640

FIG. 41



50
610
620
650
660
600
630
640
Mold and Gasket Selection
LEFT
RIGHT
Rx CLR
Rx CLR
-2.50 -0.25 X 090
-2.00 -0.75 X 165
ADD ASYM +2.00
ADD ASYM +2.00
LEFT
RIGHT
FRONT PP-74 PP-73
BACK TB-37 TB-106
GASKET G00 G00
640a
640b
640c
640d

FIG. 42

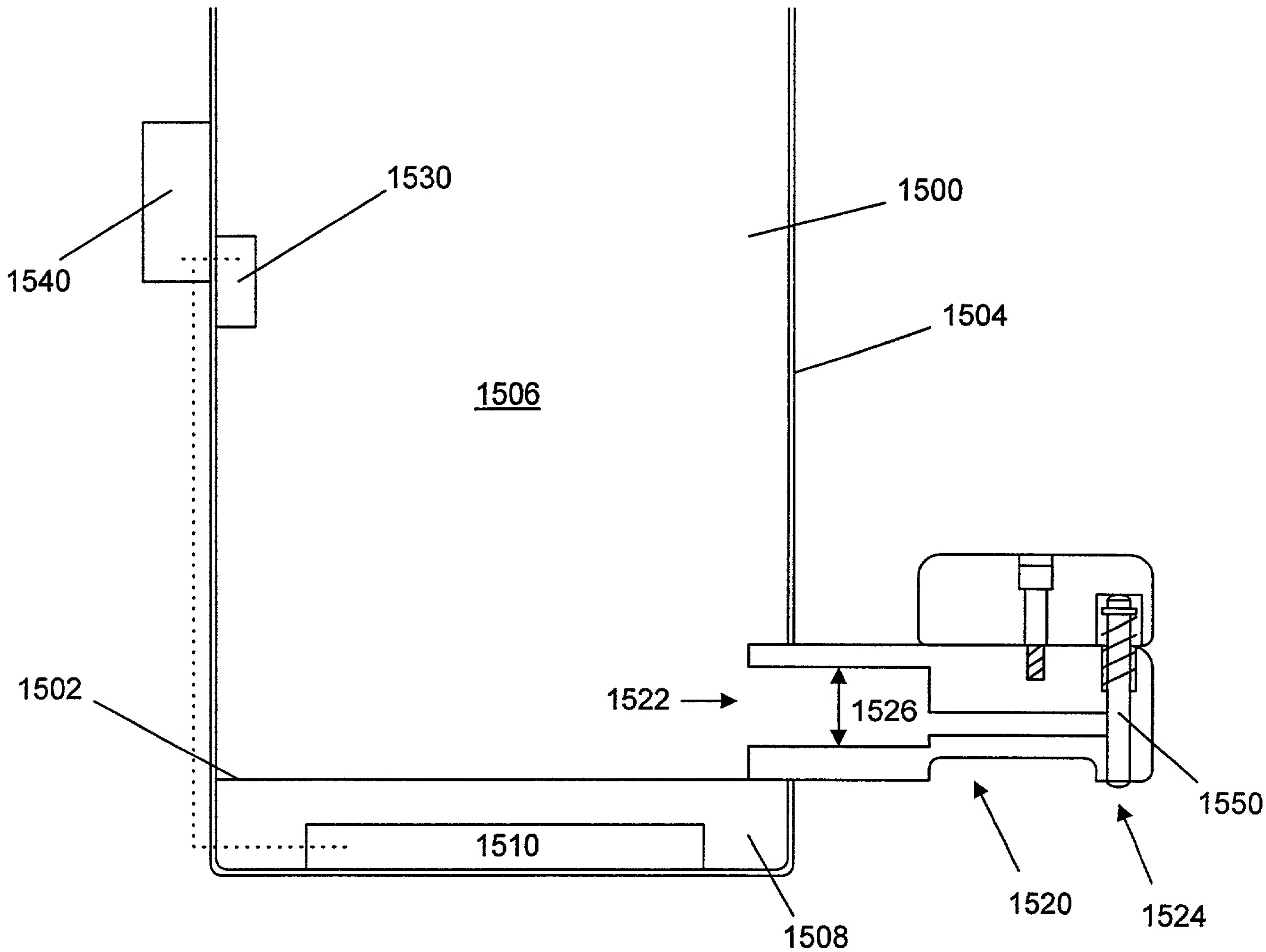

1530
1500
1540
1504
1506
1522
1526
1502
1550
1510
1520
1524
1508

FIG. 43

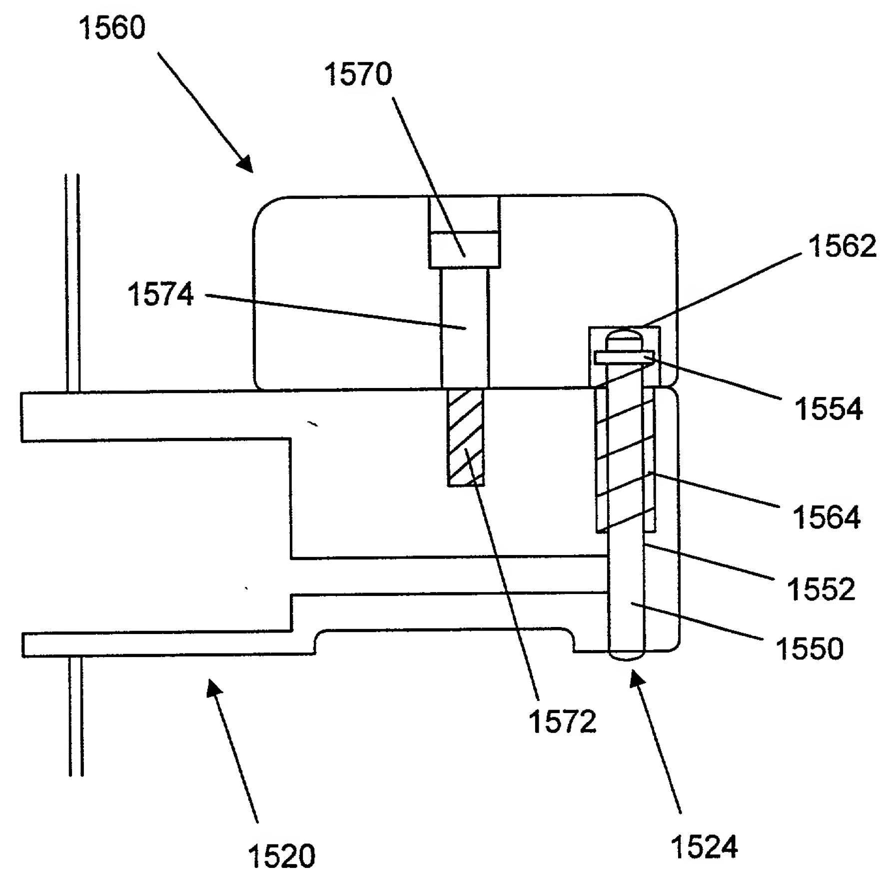


FIG. 44

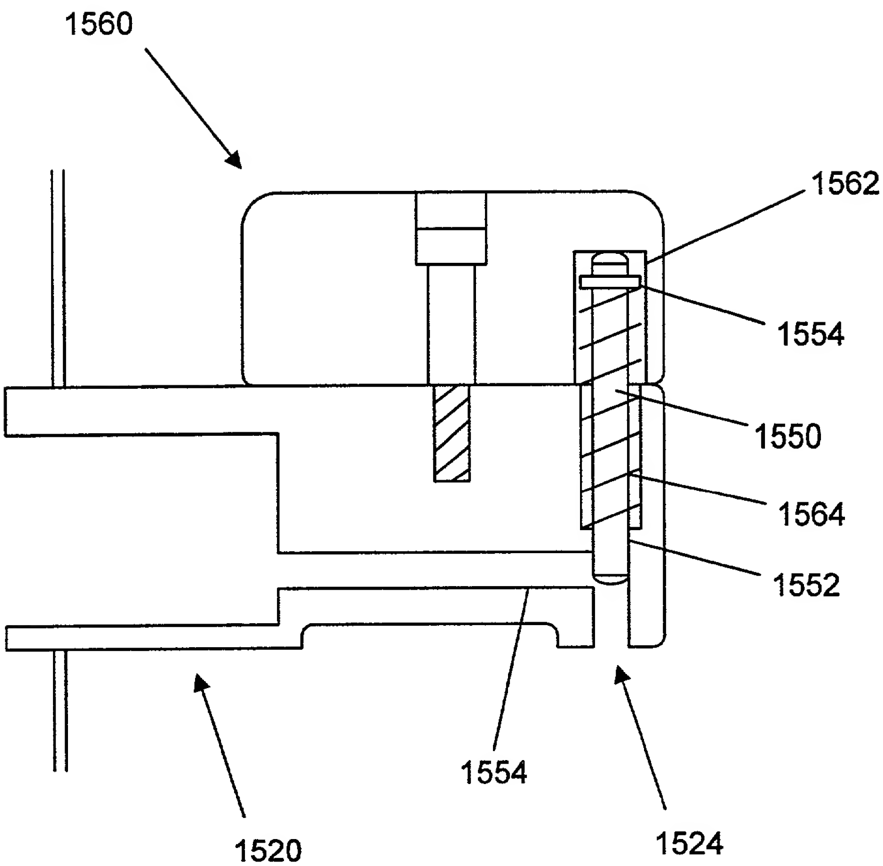


FIG. 45

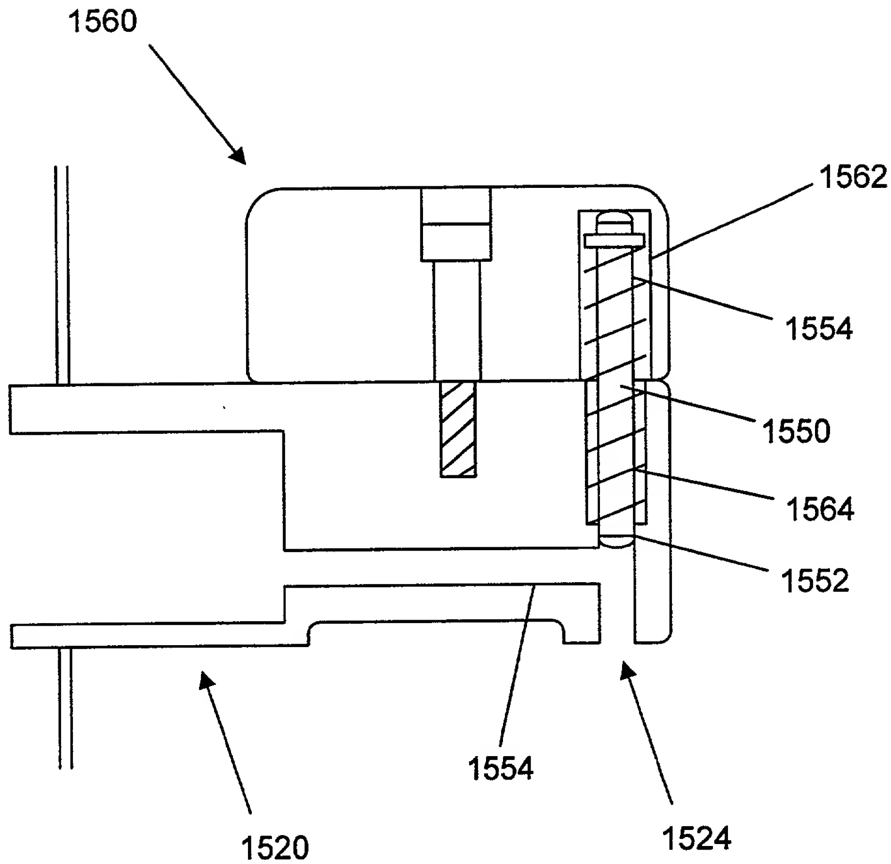


FIG. 46

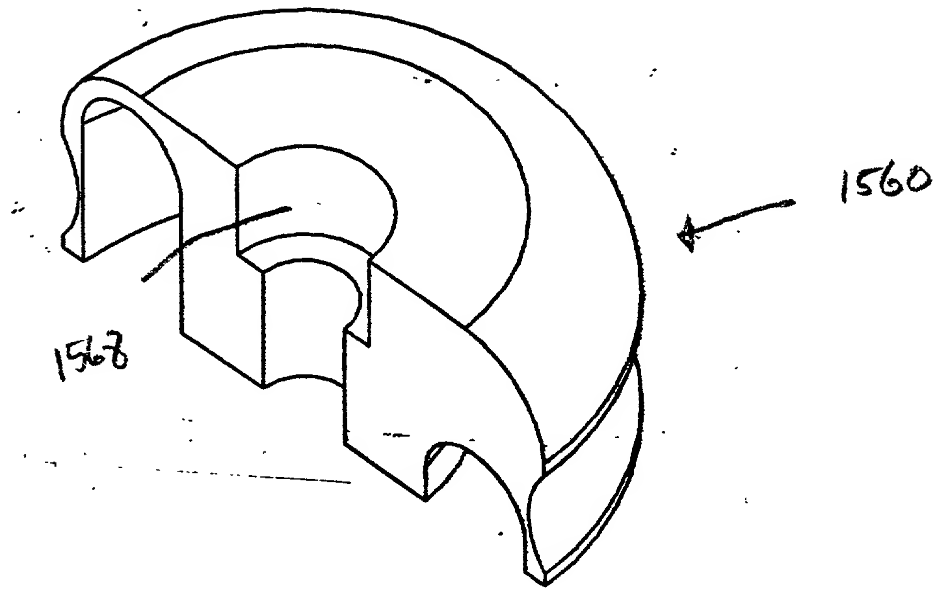


FIG. 47

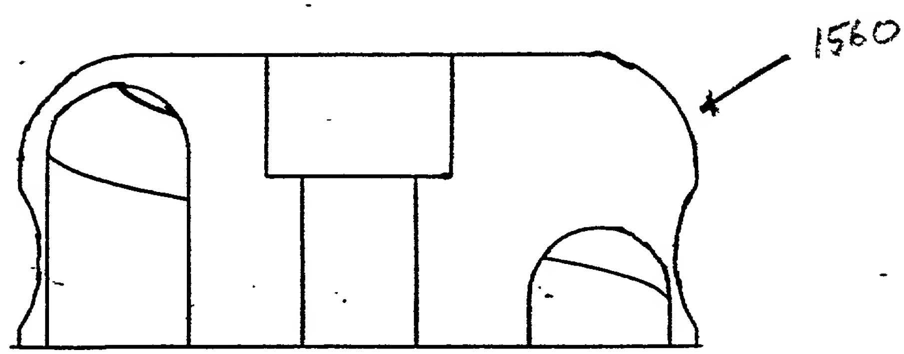


FIG. 48

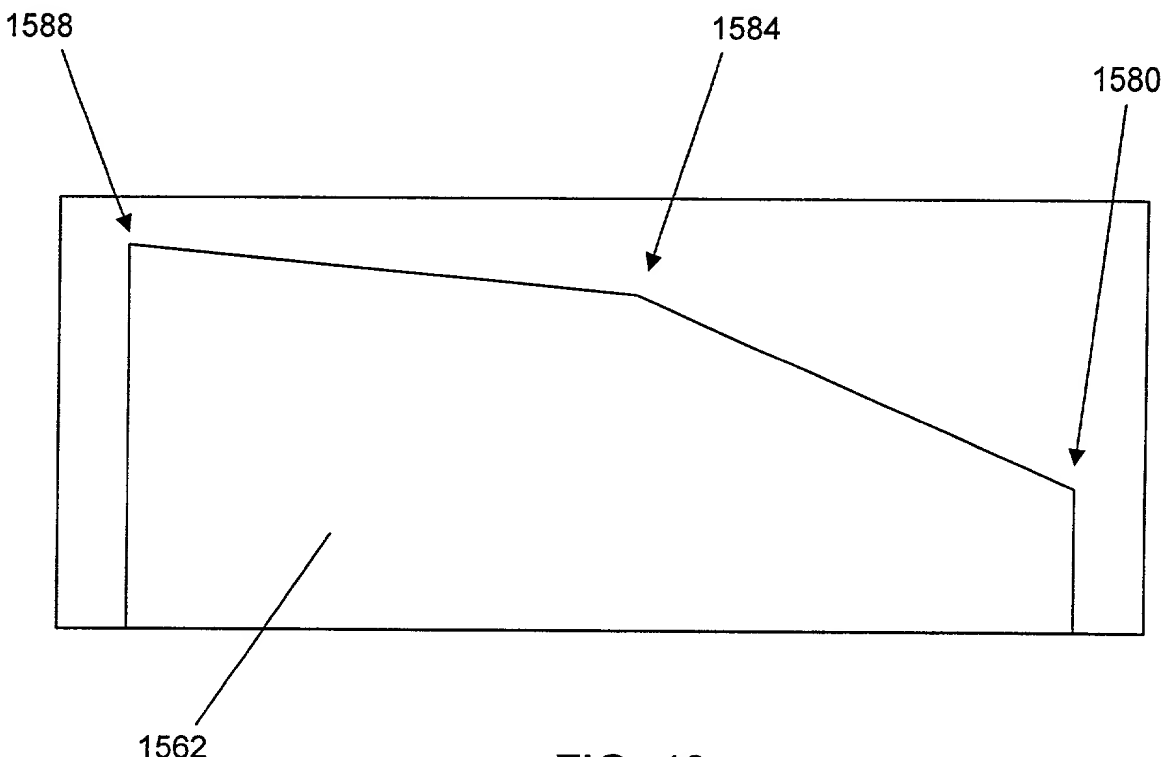


FIG. 49

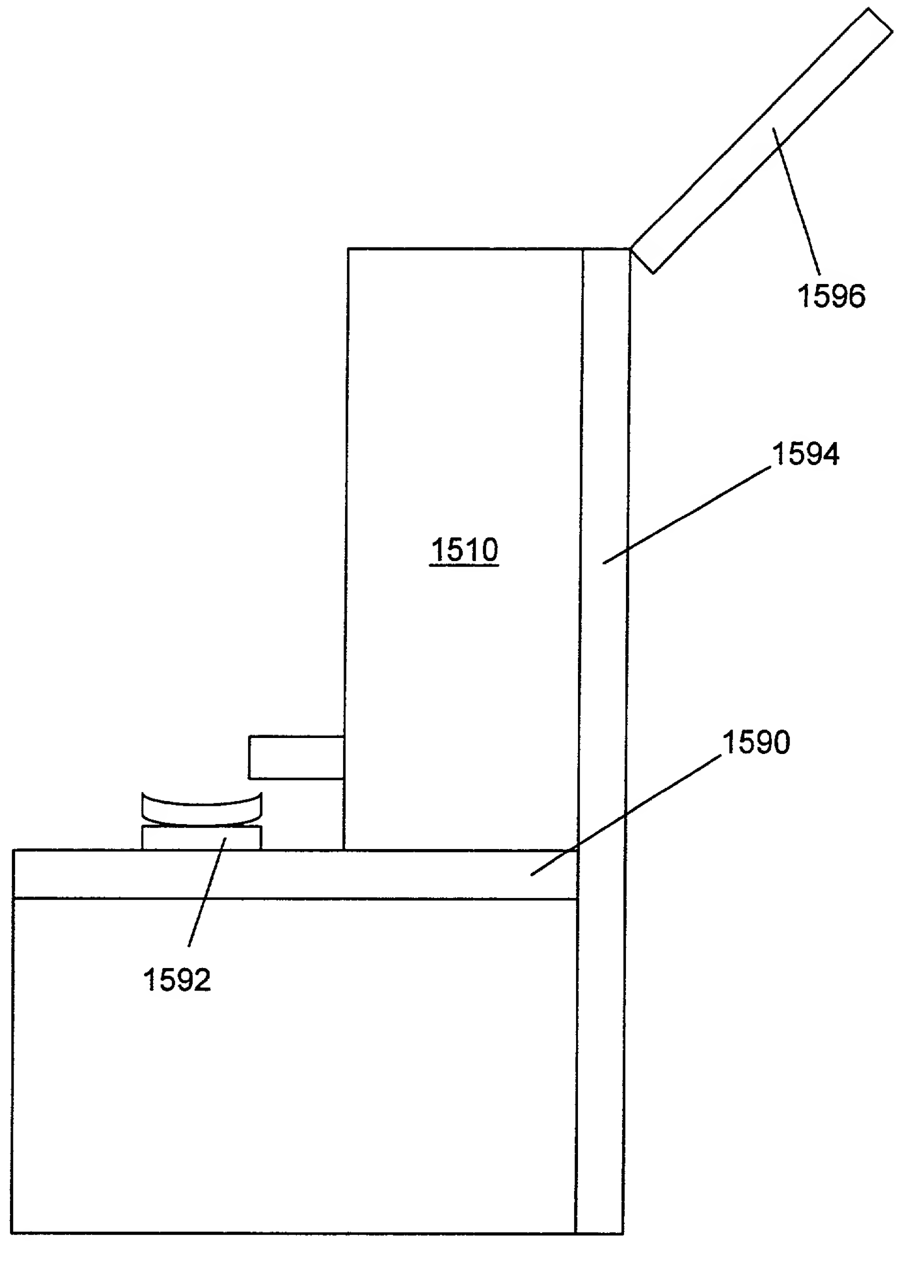


FIG. 50

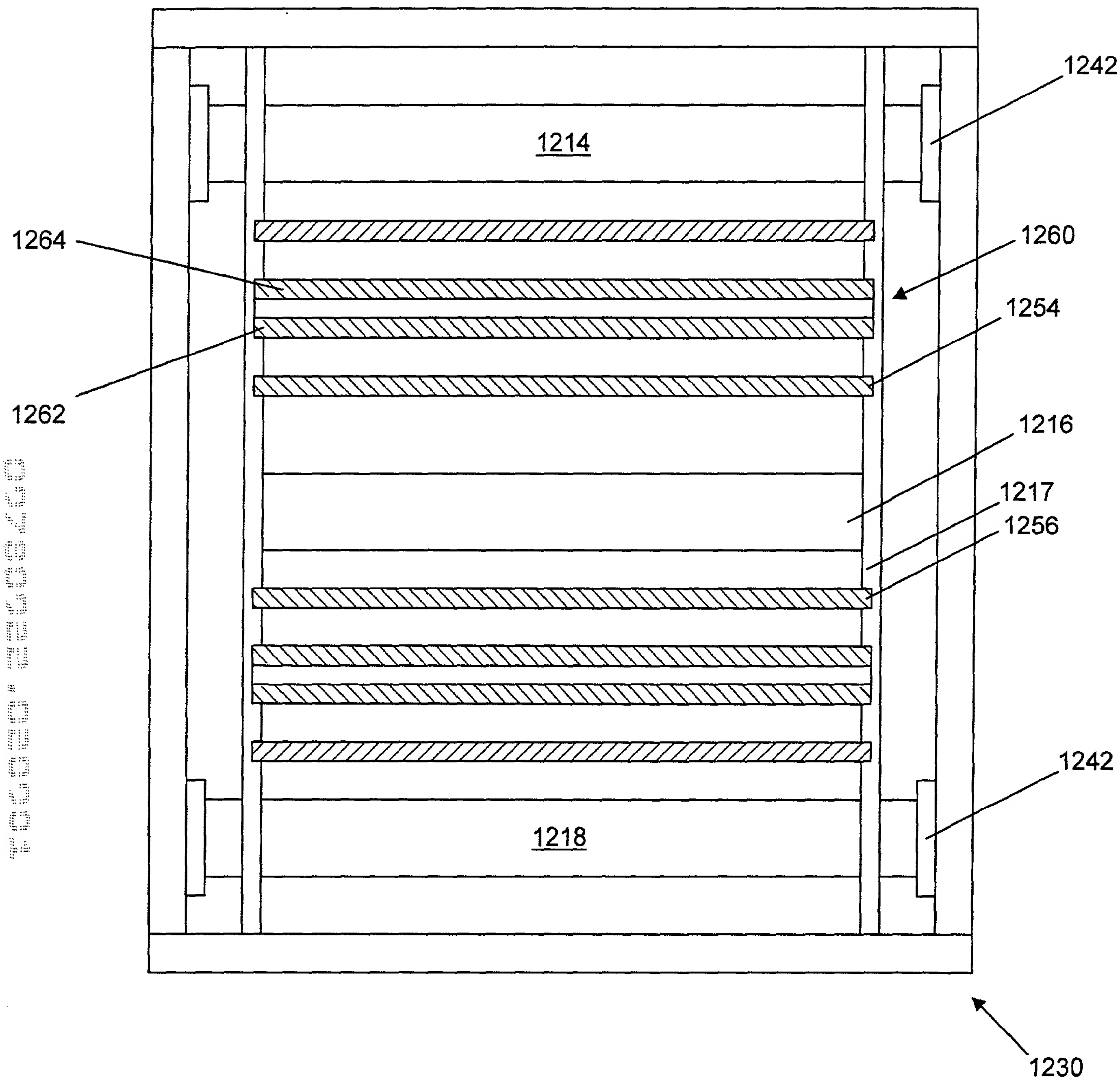


FIG. 51

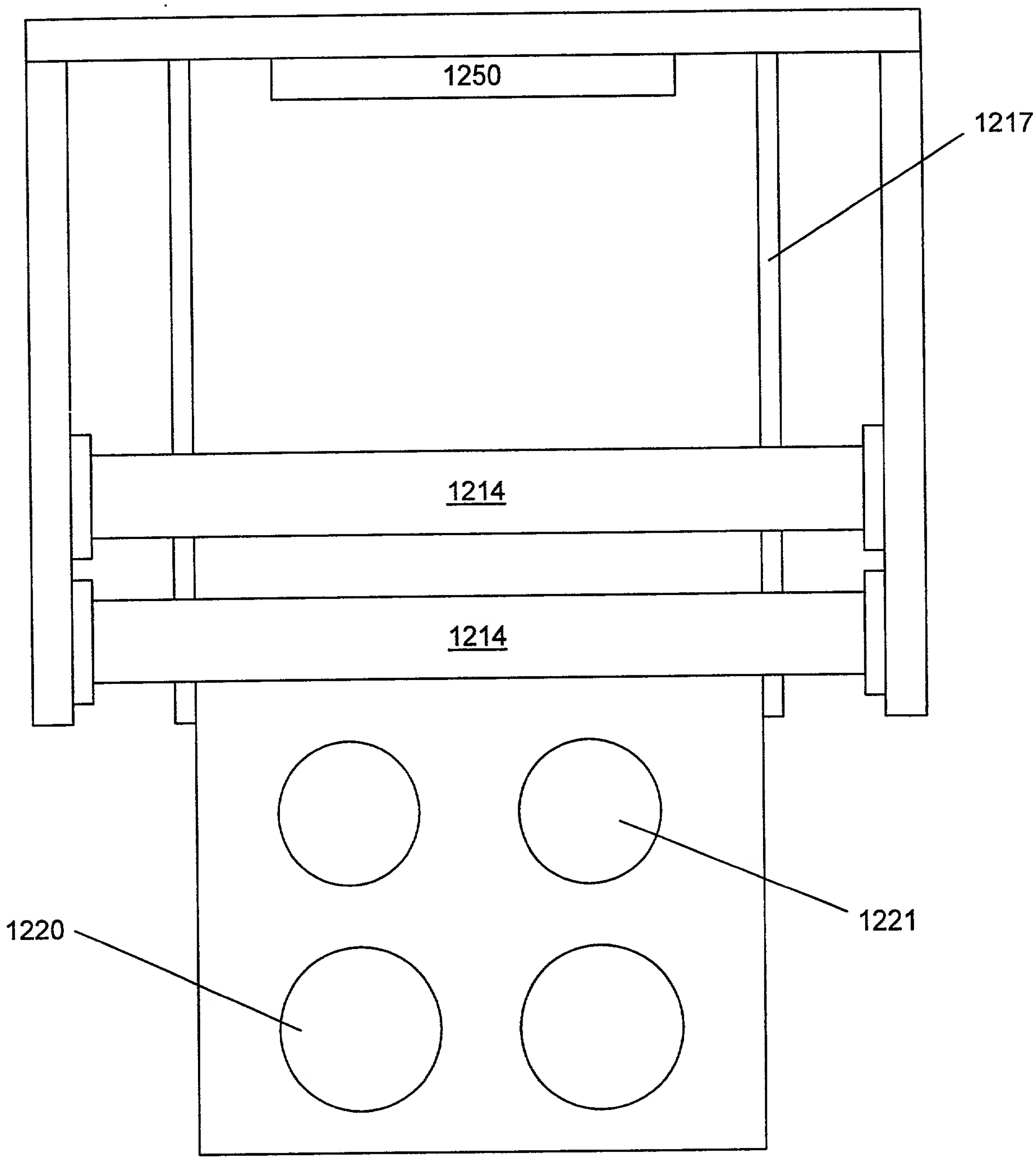


FIG. 52

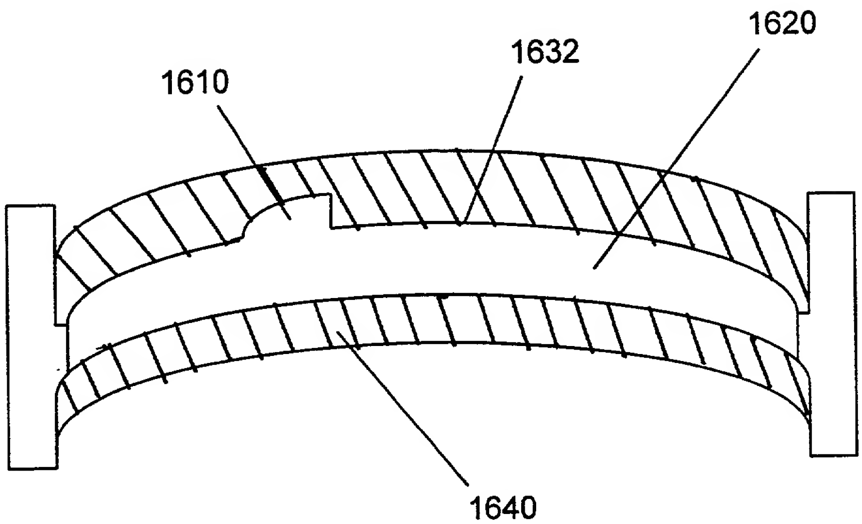


FIG. 53